

*July* 1936

# TECHNOLOGY REVIEW

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# technology review

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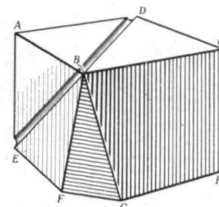
## THE TABULAR VIEW

THE Review presents in this issue (pages 385 to 410) the complete proceedings of the Transportation Conference held at the Institute on Alumni Day, and gives you here a brief identification for each speaker.

¶ The HON. JOHN MONROE JOHNSON, who presided, has had experience as a civil engineer, and as an executive; he rose from sergeant in the volunteer infantry of the Spanish war to colonel of the Engineers, Rainbow Division, in the World War. From 1916 to 1917 he was chief engineer and chairman of the Marion County Highway Commission. ¶ EDWARD P. FARLEY is chairman of the executive committee of the American-Hawaiian Steamship Company, president of a ship-line company that bears his name, and director of the International Zeppelin Transport Company. He formerly served as chairman of the United States Shipping Board and as president of the Emergency Fleet Corporation. ¶ EDWIN W. JAMES, '07, Chief of the Division of Highway Transportation of the United States Bureau of Public Roads, has served in the Philippines and has been a member of the United States Engineering Corps. In 1926 he was technical adviser at the International Diplomatic Conference on Automobile Circulation and later was in charge of surveys for International Highway. ¶ CHARLES D. YOUNG, Vice-President of the Pennsylvania Railroad, has been with that road since 1900. He is acquainted with their problems "from the ground up," having risen steadily to the executive position he now holds. ¶ EDGAR S. GORRELL, '17, now President of the Air Transport Association of America, was sent to Europe by President Wilson as a member of the Balling Mission and has represented the United States in more than 200 international conferences. ¶ JOSEPH B. EASTMAN, Federal Coördinator of Transportation (this office expired on June 17), received this title in 1933. He is a member of the Interstate Commerce Commission.

COVER CLUB membership has not increased with the publication of this issue as we have used another photograph submitted by WILLIAM C. WEST, '11, whose picture, "Translucence," appeared on the April cover. The view of the Chicago River used here shows, on the right bank, the Fisk Street Station of the Commonwealth Edison Company and, on the left bank, their Quarry Street Station.

THE solution to Professor Hudson's problem in the May issue of The Review (page 325) has been submitted by A. D. SMITH, '04. If you haven't finished working on it, close your eyes: I DO NOT LIKE IT SAID THE MAN WITH THE BLACK TIE. THE RITE WE HAVE WITNESSED IS IMPRESSIVE BUT WHEN YOU INTER A MAN YOU RETAIN A CERTAIN POWER OF INVESTIGATION. THERE IS BOUND TO BE A REACTION AGAINST CREMATION WHEN THE IMPORTANCE OF THIS IS REALIZED. IF THE PRACTICE SHOULD PROVE TO BE AN IMPRECATION OTHER IMPRECATIONS MIGHT FOLLOW.



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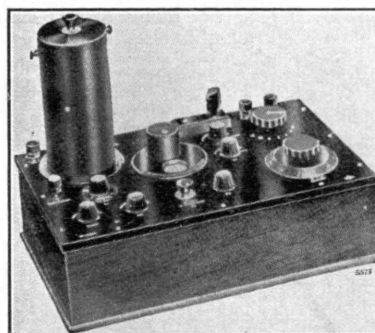
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| Year | No. Pumps |
|------|-----------|
| 1927 | 1         |
| 1928 | 8         |
| 1929 | 0         |
| 1930 | 0         |
| 1931 | 2         |
| 1932 | 4         |
| 1933 | 8         |
| 1934 | 1         |
| 1935 | 3         |
| 1936 | 6         |
|      | 33        |

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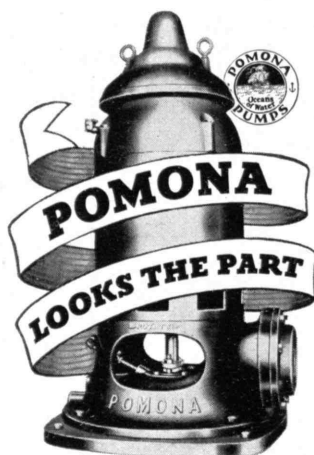
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## MAIL RETURNS

### Protest

From PROFESSOR L. MAGRUDER PASSANO:

If, in his interesting article in the May Review, "Science and the Fine Arts," Professor Hudson had limited himself to the statements of the title and subtitle, one could offer no criticism, but when he speaks of science as an inspiration of art one must, in the interest of truth, protest.

No one would deny that some scientists, perhaps as many as of ordinary men, have a true appreciation of art. But it is not wise for Professor Hudson to cite the long list of Technology men who have distinguished themselves in the arts to prove his thesis. They may well have been congenital artists whom a scientific education could not change or spoil—round pegs that succeeded in pulling themselves out of square holes. Leonardo da Vinci, perhaps the world's most universal genius, was a painter, musician, poet, and scientist in the order named. Lewis Carroll is far better known to fame than Charles L. Dodgson, the latter name being hardly more than an unfamiliar alias. Professor Hudson himself asserts that Sir Joshua Reynolds inspired the inventor Edison. On the other hand, if the science of the astronomer, Simon Newcomb, inspired his poetry, the result was shown chiefly in the *abundance* of his verse.

Professor Hudson surely delimits the avenues of approach of beauty too narrowly. Taste and smell may be discarded, but not touch. Any connoisseur will want to touch, to feel the texture and form of a Chinese vase, and many have the same impulse toward an ivory carving, a fine textile, or even a bronze or marble statue.

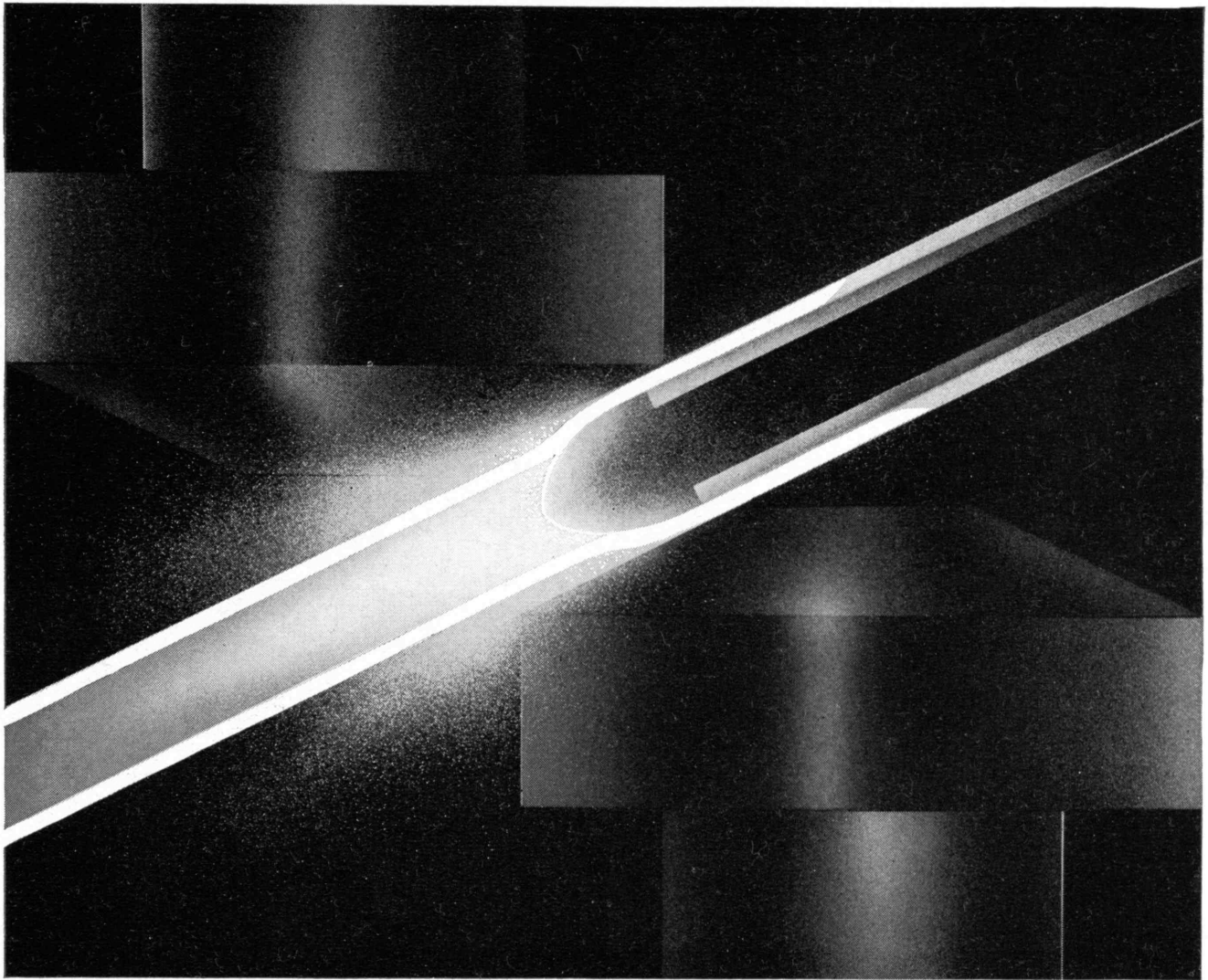
Science is ancillary to art. It is a servant helping art to achieve its ends. When carving is done by machinery, endlessly producing replicas of a pattern, like "gas pipe" suitings, one feels that the servant has left her station; that art will have married his cook. Science may also interpret art. The artist put the transverse arm of the cross where it looked best, just as he made his columns swell toward the middle in order that they might appear straight. The scientist wished to know where that "golden section ratio" lay. One of the simple

rules of proportion told him. Thus: in the figure  $\frac{A}{y/x}$ ,  $y$  and  $x$  are the shorter and longer portions of the vertical arm of a cross. The horizontal arm crosses at  $A$ . Choose  $A$  so that  $y/x = x/y$ . Thus  $x/x+y = .618 = 21/34$ ths. Having based the artist's choice of position upon a scientific theorem, the scientist can now see the beauty of the artist's work, and will henceforth insist that all crosses be made (by machinery) in exactly the same way, whether they stand on the summit of a spire or lie on the pavement of a crypt. All crosses—even the swastika—"look alike to him," provided they are scientifically made. Thus science inspires art!

The aim of art is to know, and to know what to tell—by word, by tone, by color, by form, by symbol—with wisdom as a guide and beauty as a goal. The aim of science is to know—and tell—everything about everything. "Paint what you see as you see it" is old-fashioned and discarded, replaced by "the cubistic 'Nude Descending a Staircase'" (based, by the way, on science) which tells more. These, and all schools of painting, are now to be discarded because "the camera sees so much better," and so much more, that it is to be the "art of the future," helped out by oil paintings made by spraying or by brushes revolved by machinery. Our grandchildren may look forward to exhibitions of pictures made by a combination ordinary-infrared-x-ray camera showing everything, an "all-together" that would make even Trilby blush and drive our highly moral censors insane.

One need hardly advert to the motion picture as a form of art, but a word or two seems due to the scientific music of the future. The art of music is to "be broadened if not revolutionized" by "electrical instruments," aided by a wonderful little thing called a decibel meter, and a "new type of artist must be developed to bring out the most pleasing tones" of a mechanical, electrical instrument. The apotheosis of the organ grinder.

What of poetry, the highest of the arts? One is told that "the effect of poetry is always a gamble," and Professor Hudson proceeds to gamble with a variation on a theme by Emily Dickinson. The gamble doesn't win. One need not defend Emily Dickinson, and one cannot defend her parodist. In a scientifically inspired (*Concluded on page 422*)



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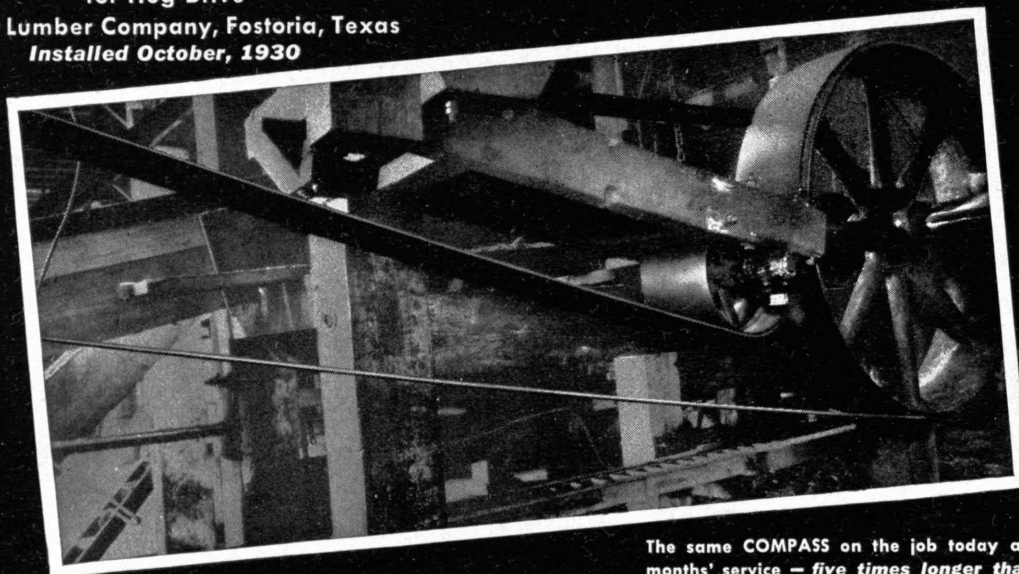


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# THE TECHNOLOGY REVIEW

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VOL. 38, NO. 9

CONTENTS

JULY, 1936

## THE COVER

*From a photograph of the Chicago River by William C. West*

|   |                       |     |
|---|-----------------------|-----|
| PLANNING FOR THE FUTURE . . . . .   | By THE M.I.T. LIBRARY | 383 |
| <i>A Reading List on the Rôle of the Technical Adviser in Industry and Government</i> |                       |     |
| TRANSPORTATION . . . . .  | SYMPOSIUM             | 385 |
| PATHWAYS OF TRANSPORTATION . . . . . 387  |                       |     |
| THE PROBLEM OF OUR COMMON CARRIERS BY WATER . . . . . 389                             |                       |     |
| HIGHWAY TRANSPORTATION . . . . . 393  |                       |     |
| THE RAILWAY OUTLOOK . . . . . 396   |                       |     |
| CURRENT TRENDS IN AIR TRANSPORTATION . . . . . 401                                    |                       |     |
| THE ENGINEER IN TRANSPORTATION . . . . . 407  |                       |     |
| <hr/>   |                       |     |
| THE TABULAR VIEW . . . . .  |                       | 369 |
| <i>Notes on Contributors and Contributions</i>  |                       |     |
| MAIL RETURNS . . . . .  |                       | 370 |
| <i>Letters from Readers</i>   |                       |     |
| THE TREND OF AFFAIRS . . . . .  |                       | 375 |
| <i>News of Science and Engineering</i>  |                       |     |
| THE INSTITUTE GAZETTE . . . . .   |                       | 411 |
| <i>Relating to the Massachusetts Institute of Technology</i>                          |                       |     |

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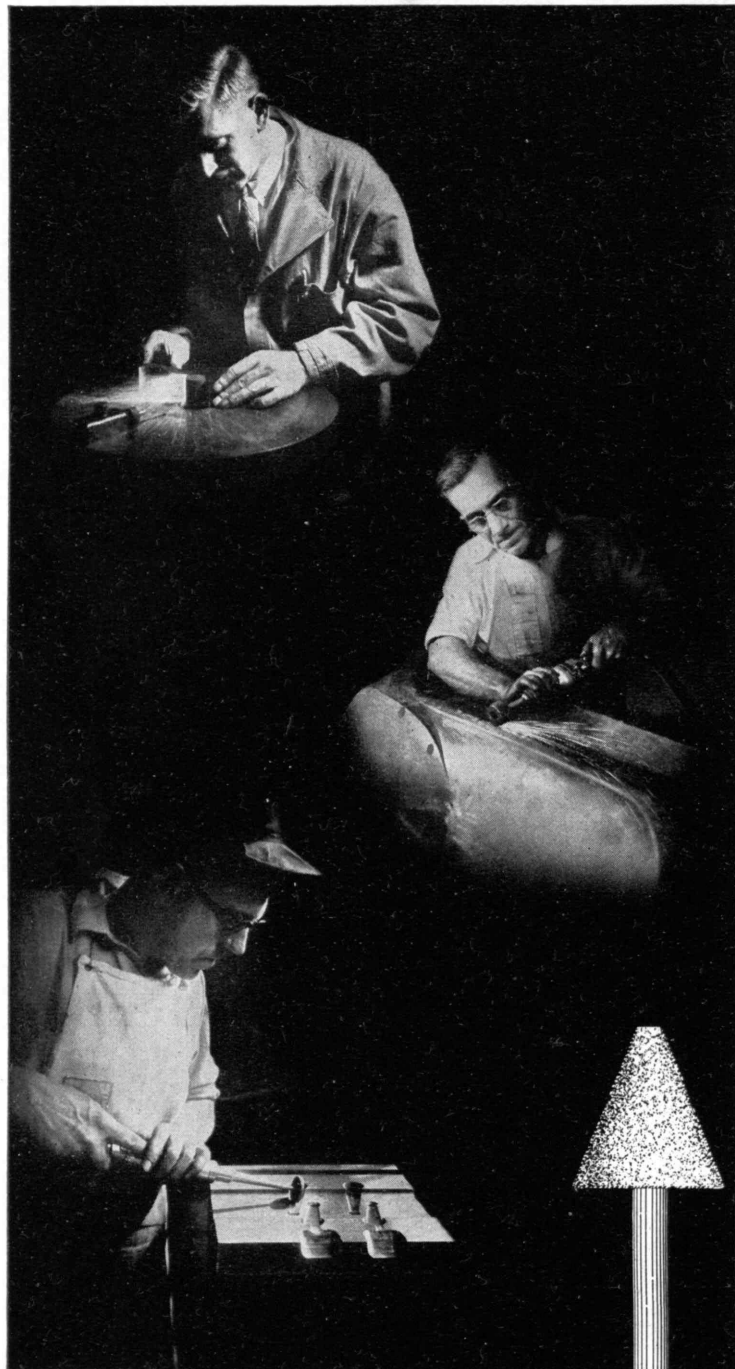
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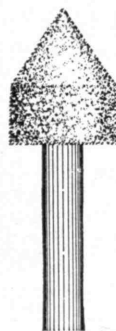
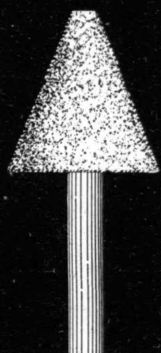
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# NORTON ABRASIVES

# THE TECHNOLOGY REVIEW

Vol. 38, No. 9



July, 1936

## The Trend of Affairs

### *Silver for Industry*

WHILE silver has long been one of the noble metals, with a social and monetary "caste," its plebeian use in industry has come almost too slowly to bolster its tottering aristocracy. Research, however, now promises to give silver a new and more important place in the world of metals.

Its curious position as a metal, the conditions that surround its production, and some of the new uses to which it is being put were described by Lawrence Addicks, '99, in an authoritative paper presented at a recent meeting of the Mining and Metallurgical Society of America. Silver is forced upon the market by the silver producers, instead of being allowed to accumulate like copper, lead, and other metals in periods of economic distress. About one half of the total production of silver is as a by-product of other ores, and about 40% of all the silver produced in the history of the world is still on hand and therefore available — at a price. The production to date, according to Mr. Addicks, has totalled 15-billion ounces, so that six-billion ounces remain to challenge the application of science.

This country normally consumes some 30-million ounces of silver, of which one third is used in photography. Of the photographic silver, with Hollywood the chief consumer, a large part is recovered from the ash of burned films; even developer, when exhausted, is made to give back much of its silver by the use of treating plants attached to the darkrooms. Another third of the output goes into silverware, and this also comes back to the smelter with the changes of fashion and the settlement of estates. Other ordinary uses include perhaps two-million ounces. Mr. Addicks concluded that we ought to consume in this country not a mere 30-million ounces, but 125-million ounces.

Recent research work, looking toward an increase in silver consumption, has been divided under four heads: silver alloys, especially those which are silver-poor; the physical properties of silver; the chemical properties of silver; most novel and intriguing, perhaps, of them all, value of silver as a destroyer of bacteria. Silver can prevent bacterial action where such action is not wanted, for, if silver or metallic silver ions are introduced into water in the proportion of one part in 10 million, it will very rapidly sterilize the water.

Mr. Addicks discussed this bactericidal use of silver for public water supplies and swimming pools, mentioned a pocket-sized silver sterilizer for travelers in the tropics, referred to the use of silver in purifying aquariums, told of silver-sterilized ice, suggested a nonirritant soap containing a silver salt, and stressed the fact that silver-lined containers are considered best for fruit juices. Incidentally, he mentioned that vinegar will keep indefinitely in a silver-lined container, and that wines and beers in such containers suffer no deterioration.

Silver-sterilizing spray improves the quality of tobaccos, and a German hospital has formally stated that a bolus in which silver had been mixed cured tonsillitis when enfolded in the crypts of the tonsils. External sterilization of wounds through the use of silver was yet another medical use to which Mr. Addicks made reference, recalling that the Egyptians used silver plates on wounds to promote healing.

As substantial possibilities for the use of silver he mentioned silver-alloy bearings for automobiles, which are made of cadmium and a small quantity of copper with from three quarters of one per cent to one-and-three-quarters per cent of silver added.

Lighter storage-battery plates, silver silicon, silver-hardened tin, silver sulphide as a conductor of electricity, silver commutators on automobiles — all were spoken of





William E. Davidson

Above. Tower of the San Francisco-Oakland Bay Bridge silhouetted against an early morning sky. Stiffening trusses may be seen suspended from the main cables, and the traveler filling in deck steel

Below. Cape Cod Canal by night and one of the beautiful bridges designed by Fay ('93), Spofford ('93) and Thorndike

as promising uses of silver, while the thermal conductivity of silver was emphasized as a fact important to those interested in the equalization of furnace temperatures.

### Cancer Campaigns

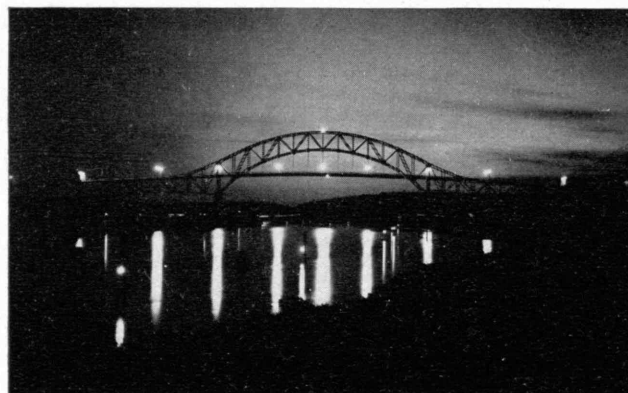
CANCER in the United States ranks second as a cause of death and its yearly cost to the American people has been estimated at the colossal figure of \$800,000,000. The battle to conquer the scourge is being waged on a thousand fronts, and as the terms of the problem are narrowed by a truly stupendous accumulation of facts, researchers must surely be coming closer and closer to victory. Two or three recent developments, in fact, point toward an advance in knowledge that may be of lasting importance. That the task of research may be more direct than we have thought was indicated in February when Dr. Francis Carter Wood, director of the Crocker Institute of Cancer Research at Columbia University, suggested that the search for the cause may be narrowed to a comparatively small number of agents

"responsible for many types of animal and, possibly, human cancer." Though the task of finding the cause will not necessarily be rendered any less arduous by the suggested limitation of possibilities, it will be clarified somewhat if Dr. Wood's belief is confirmed. The great variety of cancerous growths has in the past occasioned belief that the number of causes might be equally great. One parasitic worm has produced 18 varieties of tumor in rats, however, and chemical substances which have been used experimentally to produce cancer, it is reported by Dr. Wood, "bid fair to produce an equal or larger number."

In 1775 an English physician observed that the cancer prevalent among chimney sweeps was caused by soot, and in 1915 two Japanese scientists, by repeatedly painting the ear of a rabbit with tar, induced there a cancerous growth. These widely separated discoveries established coal tar (or some of its derivatives) as a causative agent in certain types of cancer, and provided the investigator with a method for the experimental production of cancer in laboratory animals.

They also posed a problem for the organic chemist: Is there some common denominator, perhaps of molecular structure or some other chemical relationship, among the various cancer-producing coal-tar compounds that have been discovered in his laboratory? There is yet no assurance that such a common factor, present in these compounds, can be found, but chemists are at work on the problem.

The baffling hunt for the cause of cancer may have been given new and more nearly correct direction by these findings, but no basis for prediction of the early discovery of a cure has been set up by it as yet. Setting one disease to fight another, as has been done in some other fields, was, however, reported by Dr. Mendel Jacobi of the Beth-El Hospital in Brooklyn as possessing effectiveness in experimental work on cancer. Injections of a diluted filtrate of the typhoid bacillus were used by Dr. Jacobi to treat animals having tumors chosen for their "high growth energy and degree of malignancy." The filtrates were first injected directly into the tumor, and about a day later a general injection was made through a vein of the abdominal wall. In the 70 animals thus treated the tumor began to break up within a few hours and finally disappeared. The local injection, it was found, must be made first, and neither injection is effective if used alone. Although the method was used in one human being, already moribund with a hopeless



A. S. Beale, '13

cancer, and was shown by autopsy virtually to have destroyed the cancer tissue, much more work must be done before the usefulness of the treatment in human cancer will be ascertained.

### *Our Diffident Dictator*

HE who pays the piper calls the tune," runs the old adage, and American business adds smugly: "The customer is always right." From these propositions, design of consumer products for sales appeal follows naturally. Thus, artist-engineers who skillfully alter the appearance of such articles as domestic appliances, sanitary accessories, and business machines so that they are not only suited to the buyer's convenience but also to his idea of art, have received wide publicity and the approval of both businessman and customer. Nor is the engineer particularly affected so long as this expression of consumer control confines itself to making colored toilet seats of mother-of-pearl finish for the Mexican trade, but the engineer is not so sure of his peace of mind when he regards such a product of consumer control as the automobile, as Dean A. Fales, '14, pointed out in the April issue of *The Review* (page 276). Even dismissing from the discussion design factors affecting the primary question of safety, the engineer would find it difficult to justify such an addition to a pleasure vehicle as a super-charger on any technical or economic grounds. As the sales manager would probably admit in a candid mood (if sales managers experience candid moods), the super-charger is intended not so much to boost engine power as it is to boost the driver's ego.

However, the control of that supposedly humble and neglected individual, the consumer, often builds up more complex, if less disturbing, ramifications. Consider, for example, that gadget, the electric clock. Its advent meant only a minor addition to central-station load, but its widespread use forced radical changes in the operation of electrical power systems — primarily with respect to frequency control. Its effectiveness as a stimulus to continuity of service also, has, been far out of proportion to its current consumption. Only a short time ago, except in large cities, the quality of electric-current service during the early hours of the morning was of concern mainly to those few who kept such unholy hours. When service failures occurred the public utilities could disregard scattered protests of these few with impunity, but when droves of householders began to arise in the morning to find their synchronous clocks stopped or the "absolutely" correct time incorrect enough to make them miss their trains, their combined wrath made central stations take remedial measures.

Thus the consumer's yearning for electric clocks, plus the greater interconnection of power systems in the interests of reliability, have made the utilities devise extremely sensitive governors for the control of frequency. So that the \$2.15 kitchen clock may stay on time, the speed of a 150,000-kilowatt turboalternator is kept steady to within  $\frac{1}{25}$ th of one per cent.

The attention that has been given to smoke and fly-ash control in recent years is basically a product of public pressure, for in many cases the changes which power plants have introduced in order to control this

nuisance are not justified by economic considerations. Most modern central stations now scrub and wash their flue gases as carefully as a housewife does her laundry, but at considerably greater expense. In the case of pulverized coal there is sometimes a partial return, for the recovered fly ash can be used in making concrete. Not only are elaborate separators and precipitators in-



*Twilight in Chicago*

*William C. West, '11*

stalled, but also, in the case of old equipment, changes in boiler settings and fuel-handling equipment are often necessary. A cursory study of the literature will reveal how extensive (and expensive) have been developments in the handling of stack emissions. (Ironically, most of the pollution of the atmosphere by smoke and ash comes from domestic heating systems.)

There is another change in consumer buying habits that is interesting to the power engineer. Within the past decade there has been an enormous increase in the number of electrical appliances used in the average home. Refrigerators, washing machines, ironers, and, still rather slowly, air-conditioning apparatus are all adding to the residential current load. From the strain that is being put on the distribution systems in resi-



dential districts and on the wiring of individual houses, there are resulting improved technical treatment of low-voltage networks and relatively inexpensive methods of adding to capacity of wiring in houses finding their electrical systems overstressed. One annoying symptom of overloading is the burning out of the usual plug fuses with distressing frequency, so there has been developed a type of thermal circuit breaker suitable for homes.

Two more instances may suffice: The petroleum industry is noting with great satisfaction that its fastest growing market increased its consumption by 17% last year. That market was the domestic fuel-oil field. The number of houses heated by oil has doubled in the past six years. When it is considered that 85% of the country's power-producing machinery is represented by its 26,000,000 road vehicles, and that the amount of oil burned by central stations is practically static, if not decreasing — for increased demand for electricity is met by greater efficiency in equipment — the influence of the domestic market in the oil industry can be imagined. The two most significant technical advances in oil refining during the past decade have been, probably, the introduction of polymerization and volatility control in the manufacture of gasoline.

Is a locomotive a "consumer product"? Whether it is or no, the railroads are certainly treating it as one. As the design of locomotives recently built or now building indicates, there is a considerable trend toward streamlining, determined in large measure by what the railroads consider as pleasing to the esthetic taste of the public.

In no country on earth does the engineer bend as willingly an ear to the whims, the desires, the needs of the public as he does in the United States. On the whole that ready yielding, or rather catering, to consumer demands has been an important factor in creating the material

comfort that marks American life. Sometimes the results are of dubious value, as in the "streamlining" of refrigerators and locomotives; occasionally, as in the case of the automobile, the buyer definitely does not know what is good for him. Nevertheless, in the future as in the past, industry will continue to chant: "Praised be that diffident dictator, the American public."

### *To Down Dusty Death*

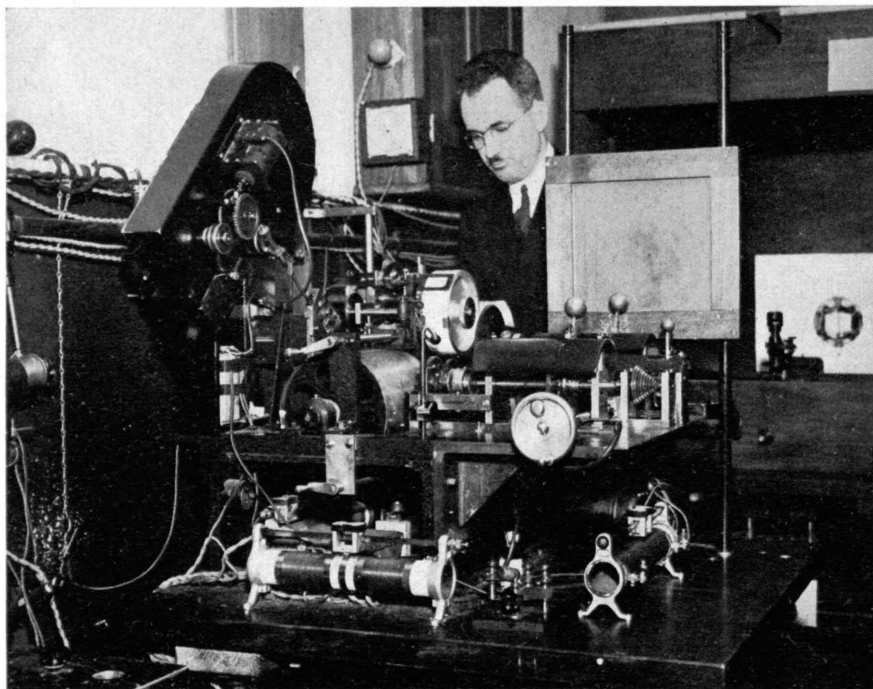
DEATH disguised in particles of dust so minute as to be invisible must test its mettle against that of the Federal government represented in a committee of 53, named by Frances Perkins, Secretary of Labor, to work out plans for the control and termination of silicosis as an industrial hazard.

Nearly the entire population of the country breathes in small particles of dust containing silica, the inhalation of which causes the disease. That the whole population does not suffer from silicosis, however, results from the fact that the lungs appear to have a tolerance of at least 0.217% of rock dust, for Drs. T. H. Belt, D. Irwin, and E. J. King of the University of Toronto have shown that the dried lungs contain this proportion of silica. The disease itself does not occur until the content of silica reaches five per cent and the lungs show signs of fibrosis. Why the smaller amount which nearly all persons must accumulate from street and household dust does not have a malign effect is not known.

Workers in mines, quarries, foundries, glass factories, and other industries where the inhalation of silica dust is likely — and there are about a half million of them — may readily, however, breathe in the perilous five per cent. The most dangerous particles are those so small that they are invisible as dust; these may reach the

small air cells of the lungs and cause irritation by penetrating the lining membrane. The replacement of healthy tissues by fibrous or scar tissues results. Shortness of breath, early fatigue, and general indisposition, with occasionally visible symptoms, follow; diagnosis, however, usually requires x-rays. Tuberculosis and pneumonia inevitably result from silicosis.

Miss Perkins' appointment of engineers, health experts, and representatives of workers, insurance companies, employers, technical societies, and the government to determine methods for ending this incurable disease is recognition by the nation of the size and importance of the problem. Conditions which were said to have prevailed during the boring of the Hawk's Nest power tunnel at Gauley Bridge, W. Va., and which were made worse by rumor, resulted in investigation of the situation by Congressional authority.



*Science Service*

*Professor George R. Harrison of Technology's Department of Physics and his automatic wavelength measuring, computing, and recording machine now being used in gigantic, systematic determination of wavelengths and intensities of the spectral lines of the elements*

Both the state and the city of New York, likewise, have been concerned over the danger. About 20,000 workers in the state and about 4,000 in New York City are exposed in their work to the hazards of silica and other dust. Many damage suits have been brought by sufferers who were not protected by workmen's compensation laws—one of the more recent asking damages of \$100,000. Commenting on this phase of the situation, Miss Perkins said: "An extremely expensive economic situation ensues if everyone who acquires silicosis can bring a damage suit. There has been, therefore, considerable canvassing of the laws and of methods by which this disease can practically be brought under workmen's compensation laws."

Economic, legal, and insurance phases of the problem, covering the cost of combating it are one of the four lines of attack which Miss Perkins' committee will follow. V. P. Ahearn of Washington heads the section which will consider this aspect. Dr. P. R. Sayers, surgeon of the Public Health Service, is in charge of the section concerned with the medical phase of the situation; Warren A. Cook of the State Department of Health, Hartford, Conn., the engineering; and L. Metcalfe Walling, Labor Commissioner, Providence, R. I., regulatory and administrative. The medical section will be concerned with catching the disease in incipient stages and so fighting it. Engineering control will seek to determine methods of equipping plants so as to prevent conditions conducive to the disease—work which will involve special types of ventilation designed to collect the dust at the point of origin and prevent its escaping into the workroom, wetting down processes, and the use of masks. The regulatory phase of the problem includes the devising of regulations to govern plants liable to an outbreak of the disease.

### Fruits of Research

ANYONE who questions the value of intelligent research would find a convincing answer in the amazing number of developments, inventions, and improvements in various fields that come to the attention of The Review Editors every month. It is no exaggeration to say that every issue could be filled with news of advances in science and engineering that are the fruits of investigation based on careful study of requirements, the economic necessity for using hitherto valueless by-products, and the wholesome urge to create.

From the mass of material at hand we choose those that have special interest at the moment, developments having immediate applications, and those which hold high promise for the future.



Science Service

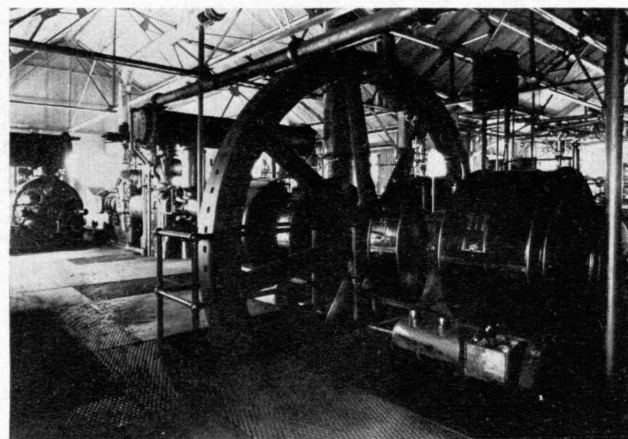
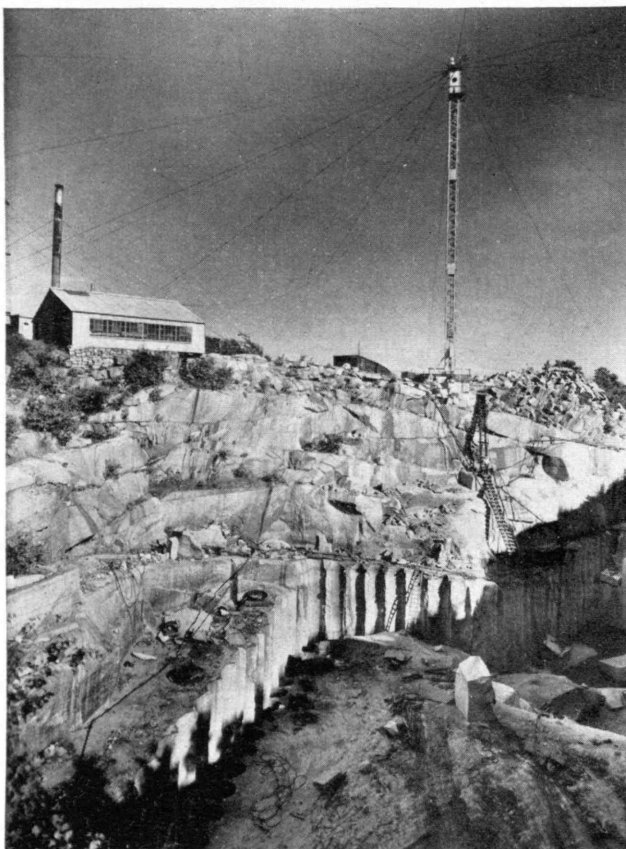
*Dr. Hammond V. Hayes, '85, veteran Boston electrical engineer, adjusts his new type of radiation receiver, which is more sensitive than photoelectric cells or the best vacuum thermocouples, for invisible infrared rays. The device makes possible signaling with invisible light. The rays are caught by the concave mirror at the left above and focused on the small cylindrical receiver. Electricity from the receiver runs through a shielded cable to an amplifying set where, finally, the signal is read with the microammeter on which Dr. Hayes's hand rests*

General Electric research engineers have developed a turbine generator which will be the first to make use of hydrogen as a cooling medium. Built for the Appalachian Electric Power Company at Logan, W. Va., this 40,000-kilowatt generator is unique in several respects: In addition to being hydrogen cooled, it will operate at a steam pressure of 1,250 pounds and a temperature of 925 degrees F., which is higher than any hitherto used in this country in a large turbine. Air friction and rotational losses have been largely eliminated by the use of hydrogen for cooling, and it is confidently expected that the new machine will operate efficiently at a speed of 3,600 revolutions per minute.

Another development of General Electric research is a prerecording oscillograph which makes it possible to anticipate a phenomenon in order to get a photographic record when it occurs. This instrument may be used to record the phenomena associated with the discharge of lightning. In a sense, it uses memory as a substitute for foreknowledge. The recording element is a cathode-ray tube, and a pencil of cathode rays traces a record of what occurs electrically on a glass slate coated with a phosphorescent substance. When electrons strike this substance it glows with a brilliant green light which lasts for a fraction of a second. This action is, in effect, one of memory, and the instrument is thus prepared to record a phenomenon occurring instantly afterward. Originally designed for studying lightning, the prerecording oscillograph now has important uses in the study of power rectifiers and various types of electronic tubes.

The Northern Illinois Coal Corporation recently placed in operation the world's largest power shovel. This Gargantuan digger has a capacity of 32 cubic yards, and in one bite it will lift enough earth to fill an ordinary room. In coal-stripping operations, where the





H. E. Fletcher Co.

*Quarrying granite in Massachusetts. Note the large core holes which permit inspection below the surface. Above is a compressor plant*

shovel is being used in handling earth, shale, and broken rock, the weight of the dipper load is 50 tons, and it is estimated that the machine will uncover well over 100,000 tons of coal a month. Operated by one man, the huge machine can pick up a load at working level and deposit it at a point 70 feet above.

Coöperating with Dr. John M. Arthur of the Boyce Thompson Institute for Plant Research and the Westchester Lighting Company, General Electric engineers have developed a new type of greenhouse which is expected to facilitate the growth of out-of-season flowers, fruits, and vegetables. In contrast to the familiar greenhouse of glass, the new one is totally enclosed except for a single row of windows on one side of its roof. This development seems to bring nearer the possibility of the earthless gardens described in the April issue of *The Review* (page 262).

A new type of shatterproof glass employing a rosin known as vinyl has been announced by the Mellon Institute of Pittsburgh. The new glass is said to be capable of stretching, and so strong is the vinyl bond between the layers that when completely shattered the fragments remain in place. A kicking mule, a football player, and a man with "an unbreakable head" played their parts in a public demonstration of this new glass, which is said to be less brittle than other types at very low temperatures.

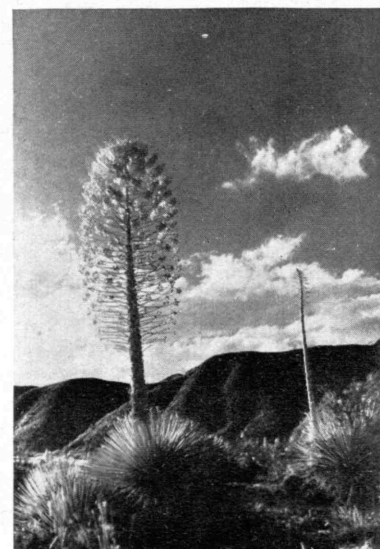
Because most of the gases used as refrigerants are virtually odorless, colorless, and tasteless, it is desirable to have some method of detecting leaks. The Linde Air Products Company has developed a device called Prest-O-Lite Halide Leak Detector. The device consists

of a needle-valve torch assembly, a burner with a suction nipple for attaching a rubber hose, and a chimney with a copper reaction plate. The open end of the suction tube is used in exploring for gas leaks and when any gas is drawn into the burner it decomposes, forming free acids. These acids in contact with the hot copper plate cause instant color changes in the flame. Needless to say, the instrument is for use in detecting noncombustible gases.

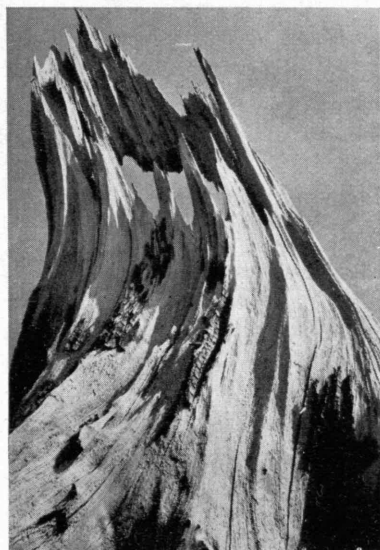
One of the bugaboos of the printing industry has always been offsetting—the effect produced by a transfer of ink from a freshly printed sheet to the back of the adjacent one as they are stacked by the printing press. The research department of American Type Founders has developed a device which spreads a microscopic film of powder over each sheet as it comes from the press. A special type of spray gun was designed to apply the powder, which is said to have no effect on the desirable qualities of printed matter.

From Germany comes news of the discovery of a method for making artificial pumice, which involves the use of volcanic glass, obsidian, which is preheated to a temperature of 1,652 degrees F., then dropped down a shaft furnace against a rising draft of hot gases. This treatment causes the material to swell into porous particles many times its original size. In this form it is consolidated with lime or cement for use as an abrasive.

The expedition now in India attempting an ascent of Mount Everest is equipped with eider-down garments made for the first time on the



Frank H. Trego



Bottom of opposite page. *Yucca* against a desert sky

Left. *Nature's wood carving*

cube cell principle. The coating is not only extremely warm, but is also very light, its weight being less than three pounds per garment.

¶ A new type of mercury arc lamp, which operates at a temperature of 25,-232 degrees F. — a heat more than

twice as great as that at the surface of the sun — was recently demonstrated in New York by Dr. John W. Marden of the Westinghouse Lamp Company. Progress in improving artificial illumination along somewhat similar lines was announced at the same time by Dr. L. J. Buttolph of the General Electric Vapor Lamp Company, who described experiments with a new-type fluorescent mercury lamp. Using invisible ultraviolet to produce visible light of all colors, the fluorescent lamps furnish from 50 to 120 times as much visible light in return for the electrical energy used as ordinary incandescent lamps do.

### *Plywoods to the Fore*

OUTSTANDING building materials development of the past year has unquestionably been the rise of resin-bonded plywoods. Plywoods themselves are far from new, the balanced stress principle having been known even by the Egyptians. All the present methods of cutting the plies of veneer, all the chief wet glues — tapioca, hide, casein, blood, albumen, soya bean — have also been known for long. Even the resin which now serves as the new binder, a resin of the phenol-formaldehyde or Bakelite type, is no novelty at all. Many manufacturers have experimented with the resin bonds for long enough to have some confidence in their present claims, but only during this year have enough presses been installed in the United States and sufficient capacity been created to warrant the assumption that resin-

bonded plywood is actually on the march. It would be fallacious, however, to assume that it had reached its destination.

At present resin-bonded plywoods are available only in the finer and more expensive woods. Because of practical limitations of press capacity it is impossible at this time to make one piece of extraordinary length. Under the cold processes where the pressing was a long-time operation it was possible to advance the stock while pressing. The resin-bonding operation, on the other hand, is quick and must be done simultaneously. Hence the length of the plywood will be governed by the length of the press, which for cost reasons will usually be limited to 12 feet or less. Fortunately the manufacturers have developed a rather fine scarfing technique which forms a splice only 10% less strong than the unspliced board.

Chief advantages of the resin-bonded plywoods lie not in their greater strengths, which were not particularly needed, but in the quickness and cleanliness of the operation, in the fact that the glues are dry — hence the wood does not have to be redried, with the danger of establishing internal stresses — and, principally, in greater waterproofness. The cost of the glue film is negligibly greater than the cost of other good glues. Principal disadvantages lie in the close precision required in the manufacturing and, at present, in the price. If there is to be hope for cheaper and, hence, more widely usable resin-bonded plywoods, cheaper woods must be used. To all intents and purposes cheaper wood means Douglas fir — and herein lies a story.

Veneers may in general be cut by one of four methods. Sawn veneers are most accurate and have the best grains and strengths, but are seldom used because at least  $\frac{1}{16}$ -inch of wood must be wasted for each ply that is cut. Fine hard-wood plies are formed by slicing with a long and heavy knife from the flitch that has been



*Mooring*

Lewis P. Tabor, '22



steamed or boiled. Rotary cutting is, however, the cheapest method and about the only one that seems sensible to use with a cheap lumber like fir. This cutting is done on a lathe which permits the log to revolve against a knife. The grain figures produced are rather wild and ordinarily undesirable, but, as will be seen later, in most cases further finishing will in any event be needed.

Rotary-cut veneers are, however, by no means of uniform thickness. The cutting knife will spring more or less, depending upon the force needed to make the cut, which in turn depends upon the character of the wood, the local hardness or softness, and the sharpness of the knife. The log, too, will spring more or less and tends to spring more as its diameter decreases. Moreover, unless the lathes are kept in first-class condition, imperfect action of gear teeth and other mechanical defects cause irregular feed. Again, the operator in cutting veneers of the same nominal dry thickness may set the feed differently at different times. Finally, the veneer when cut is very wet — much wetter than is permissible at the time of gluing, and, on drying, the veneers by no means shrink to uniform thickness.

Under the old, cold-wet process of making plywood, which has accounted for practically all of the industrial plywood in this country, the thickness variation of the veneer layers made little difference. The veneers are used with little or no sorting, an inexpensive liquid glue is applied to alternate plies in liberal quantities, a large stack of boards is piled up, one atop the next, and the entire stack pressed at once. It is essential for good gluing that adequate and relatively uniform pressure be obtained in every part of every joint. Under the old process, however, the stack had a definite cushioning effect. The veneer was quite wet from the glue and, therefore, had a reduced resistance to compression; and the long time of pressing also contributed to equalize the pressures. The cold-wet process, therefore, could not be said to be sensitive to thickness variation.

Under the processes of gluing with thermosetting resins, however, all is different. These glue films are applied either as powders or as colloidal suspensions, or, most usually now, as preformed films. To cause adhesion the plies thus brought together with glue films between must be subjected to considerable pressure and temperature, and, moreover, to pressures and temperatures that must be kept within a rather narrow range. Since wood has a considerable virtue as a thermal insulator, it is evident that a stack may not be used. If the hot platens of the press are the right temperature to set the outer boards, those in the center of the stack will be too cold; if these are to be at the right temperature, the outer boards will be overheated. This makes it practically impossible to employ the averaging effect of the stack as was done in the cold-wet process. The plies are not wet and, hence, have a good compressive strength; the time of pressing is quite short, a matter of minutes rather than hours. Thus, on all counts, the thermosetting, resin plywoods must be sensitive to variations in veneer thickness. Yet these variations in the desired cheap-wood Douglas fir are great.

Two courses are open and both have been advocated. The simpler hope is to seek the same precision in cutting Douglas fir plies that has been achieved with other ply-

woods. There is probably nothing impossible about this, but it must be remembered that the Douglas fir plywood people have been set up for a long time on a mass-production, quantity-price basis which required no precision in cutting the veneers. An attitude cannot be changed over night. There may be doubt, moreover, as to whether the cost of more precise cutting would permit Douglas fir plies still to be rated as cheap wood. In any event it is unreasonable to expect stupendous developments in this way in a hurry. The Douglas fir people may take a hitch in their belts and oil up their calipers, or they may not. If they do, plywood manufacturers will then make the plywoods by the hot-plate method in which a hot steel plate, usually heated by steam, is interposed between each panel of plywood and those above and below. The technique of hot pressing is well enough developed when the veneers are received with reasonably close tolerances.

Other workers have despaired of accurate cutting and have devised an electric press which will permit stack formation and the consequent averaging of plies. This is accomplished by the use of thin and flexible hot plates made by imbedding an electric heater, about as thick as a piece of blotting paper, inside an asbestos pad, the whole being covered with face sheets of 20-gauge steel.

Even if, one way or another, fir plywoods might be made with thermosetting resinous bonds, neither fir nor most other coniferous woods can be subjected to the high bonding temperatures required, without developing numerous fine checks in the surface plies after the panels have been removed from the press and allowed to cool. These checks may well render the surface unfit for finishing by usual methods. Additional finishing might, therefore, be required. This would perhaps be required in any event for the real field of expansion of the resin-bonded veneers lies in out-of-door work. Old-type plywoods when well made have had an honorable history when they could be protected from the ravages of the weather.

Our favorite plywood theory today suggests making the outer plies very thin — say of the order of 1/28-inch thick. Such veneers when subject to outdoor conditions do check, but since the degree of checking is a function of the thickness, the checks are practically imperceptible to the naked eye. They will, to be sure, permit some penetration of water to the first glue layer, but all the manufacturers seem to be agreed that this glue layer will resist any further penetration of moisture.

The use of such thin veneers suggests interesting possibilities in house design. It might be feasible to use, as face veneers, expensive and exotic woods in plies so thin that the resin-bonding material of the first glue layer practically impregnated them. These woods could be used in their natural colors and grains. In many cases, however, it will be desirable to have a more fireproof panel. There are certain plywoods on the market with fireproofed cores so that they will pass the more moderate fire tests. But a more likely treatment might be to glue a sheet of asbestos-cement board to the plywood. Efforts to fasten exotic wood veneers to asbestos board are illuminating. It was found in this attempt that the glue bond was satisfactory, but that the asbestos fibers were pulled from the cement rather easily, so that the final bond was not satisfactory. This difficulty has ap-

parently been overcome by first treating the asbestos board with a urea-formaldehyde resin which seems to have the property of holding down the fibers, and then gluing the veneer on with a phenol-formaldehyde resin. This product was used rather extensively on the *Queen Mary*. A similar process might be employed to glue plywood and thinner sheets of asbestos cement together, using the weather-resistant asbestos board as the covering for the stiffer and cheaper plywood, instead of using a veneer as a decorative covering for the stiffer and fire-proof asbestos board.

Considerable progress has been made with bonding metals to plywood. One such product is made up of a quarter-inch plywood board, covered on one side with a thin sheet of stainless steel and on the other with two-ounce electrolytic copper. These panels are by no means cheap at present, and sizes have to be watched because of the thermal-expansion problems raised by introducing metal, but they are used now to a considerable extent on streamline trains and in the paneling of truck bodies. Another interesting product that is not a plywood at all is made of a thin gauge metal to which a thin wood veneer, impregnated throughout with resin, has been bonded.

Whatever the exterior treatment, the edges of resin-bonded plywood are not immune from attack by moisture. Actual penetration of water through the thicknesses of the plywood can probably be prevented. At the edges, however, the entrance of water tends to cause an

expansion which, although not breaking the bond, will tend to open the joint between adjacent sheets. This is a serious difficulty. In some cases it may be overcome by carefully worked out details of design. Perhaps it will be eliminated by coating the edges with new and promising thermolyzed tung-oil enamels, perhaps by further resinous treatments.

All of this furor assumes, of course, that the resin bonds are going to stand up for a long time under out-of-door conditions. The resin makers seem reasonably confident, and so do the plywood makers. It may be mentioned that with the exception of one or two out-of-door exposures of laminated bakelites, there has been little published evidence that the resins will stand up indefinitely. It may be recalled also that many of the resins seem to lose some of their properties with age. This much is certain: The resin-glued bonds are stronger, and all accelerated tests are in their favor.

It seems very likely, therefore, that plywoods will open virgin territory in the building field for many people. There seems no doubt that the resin-bonded products will become an important adjunct to industry. It may be just as well, however, at the moment, to keep optimism within bounds; to recognize that, promising as these products are, they are by no means perfected; to realize that up to the time of this writing they are definitely not cheap; to entertain for the time being, at least, some doubts as to their behavior—doubts which we may hope will prove unfounded.

# Planning for the Future

## *A Reading List on the Rôle of the Technical Adviser in Industry and Government*

COMPILED BY THE M.I.T. LIBRARY

ADAMS, J. T. and others. New England's prospect. American Geographic Society, 1933.

"Twenty-seven writers join hands to diagnose the industrial, agricultural, political, and social activities of New England." — *Book Review Digest*.

"For New Englanders it is an especially valuable publication, while for residents of other portions of the United States it will commend itself as a pattern for similar investigations elsewhere." — *American Economic Review*.

THE AMERICAN PETROLEUM INDUSTRY; a survey of the present position of the petroleum industry and its outlook towards the future. American Petroleum Institute, 1935.

"The Institute has considered it wise to bring the 1925 survey down to date, make a study of petroleum reserves, forecast demand, and broaden the scope of the original survey by adding chapters on transportation, refining, marketing, taxation, and labor." — *Preface*.

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS. Elements of a national mineral policy. The Institute, 1934.

"Deals with the economic consequences of nationalistic ambitions upon mineral trade, the open-door policy of mineral development, tariffs, national defense, international relations, influences of national planning, stabilization and control of production." — *Annals of the American Academy of Political and Social Science*.

BAUER, CATHERINE. Modern housing. Houghton Mifflin, 1934.

"Combines the lucidity and raciness that interest the layman with the completeness, grasp, and thoroughness that the expert requires." — *New Republic*.

BEARD, C. A. The open door at home; a trial philosophy of national interest. Macmillan, 1934.

"In his opinion, the United States should till its own garden and not cast envious eyes on foreign markets; the theories of Adam Smith belong to the pre-machine age, and today the magic of science can provide for the wants of the American people if only we insure the proper distribution of wealth." — *New York Herald Tribune Books*.



BEMIS, A. F. Rational design (Volume 3 of The Evolving House). The Technology Press, 1936.

Aims to analyze house structure, to state fully the terms of this important and pressing problem, and to present a logical solution in the redesign of man's shelter.

CHASE, STUART. Government in business. Macmillan, 1935.

"The rôle of government in business has been steadily expanding, both in Europe and America, and in recent years has reached an accelerative pace. It has expanded [the author holds] because it had to: because private enterprise has been either unable or unwilling, in one field after another, to do what had to be done." — *New York Times*.

CROWTHER, SAMUEL. America self-contained. Doubleday, 1933.

"Mr. Crowther holds that America is self-contained and should depend on her own resources, and formulate a system of national economy suited to her own needs." — *Book Review Digest*.

DIMOCK, M. E. Developing America's waterways; administration of the Inland Waterways Corporation. University of Chicago Press, 1936.

"From the points of view of economic justification and efficiency in management." — *Science News Letter*.

FLANDERS, R. E. Platform for America. McGraw-Hill, 1936.

"The author believes that modern technology plus private enterprise and liberal democracy have maintained a larger number of people at a higher standard of living than any other system which has ever existed in the history of the world. . . . This book seems to me the most reasonable and clear statement of the viewpoint of an intelligent industrialist which has come to my desk." — Dorothy Thompson (Mrs. Sinclair Lewis) in *New York Herald Tribune*.

GAYER, A. D. Public works in prosperity and depression. National Bureau of Economic Research, 1935.

"Best available information concerning the volume of public works undertaken by local, state, and Federal governments . . . and the numerous factors that bear upon efforts to use public works as an economic stabilizing device." — *Municipal Reference Library Notes*.

HART, J. K. Education for an age of power. Harper, 1935.

"Sets forth the dramatic impact of power development within such a limited area as the Tennessee Valley and portrays it both factually and creatively." — *Western Society of Engineers Bulletin*.

HAYNES, WILLIAM. Men, money and molecules. Doubleday, 1936.

"Popular history of the economics of our chemical industries by the editor and publisher of *Chemical Industries*." — *New York Public Library New Technical Books*.

ICKES, HAROLD LeC. Back to work; the story of PWA. Macmillan, 1935.

"Describes what is being accomplished particularly in the fields of slum clearance, development of water power, and improvement of roads and railroads." — *American Library Association Booklist*.

JESNESS, O. B. and others. Program for land use in northern Minnesota; a type study in land utilization. University of Minnesota Press, 1935.

"A notable contribution to land economics, land planning,

and political science as related to land utilization." — *Journal of Farm Economics*.

LOEB, HAROLD and others. The chart of plenty; a study of America's product capacity based on the findings of the National Survey of Potential Product Capacity; foreword by Stuart Chase. Viking Press, 1935.

"The first attempt to apply the rationality of engineering and accountancy to the central problem of American life and economy, namely, the capacity of American technology to provide a decent standard of living for all the people in the United States." — C. A. Beard in the *New Republic*.

MATTHEWS, D. M. The management of American forests. McGraw-Hill, 1935.

"Deals with practical problems of management of forest property in the United States from both the technical and the financial standpoint." — *Preface*.

MILLER, S. L. Inland transportation: principles and policies. McGraw-Hill, 1933.

"In addition to the history of American railroad transportation, this volume analyzes motor, inland water, air and pipe-line transportation." — *Book Review Digest*.

NATIONAL ACADEMY OF SCIENCES. Report of the Standing Committee on Government Relations on the rôle of science in national planning. 1934.

NEWMAN, B. H. The building industry and business cycles. University of Chicago Press, 1935.

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# TRANSPORTATION

ITS PLACE IN THE NATIONAL ECONOMY, ITS PROBLEMS, AND ITS FUTURE DEVELOPMENT

## CONTENTS

*(Proceedings of the Conference on Transportation held at the Massachusetts Institute of Technology on Alumni Day, June 8, 1936)*

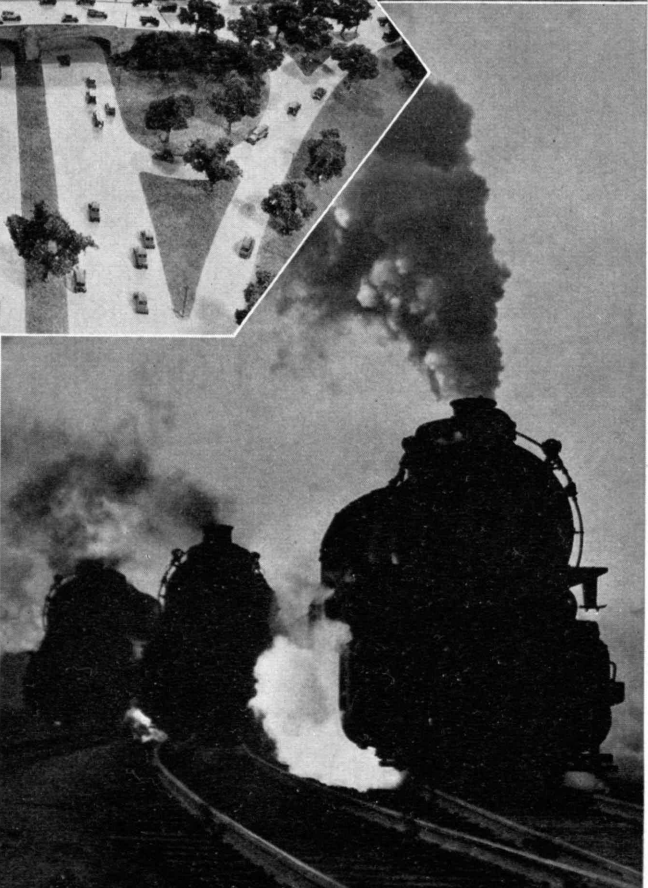
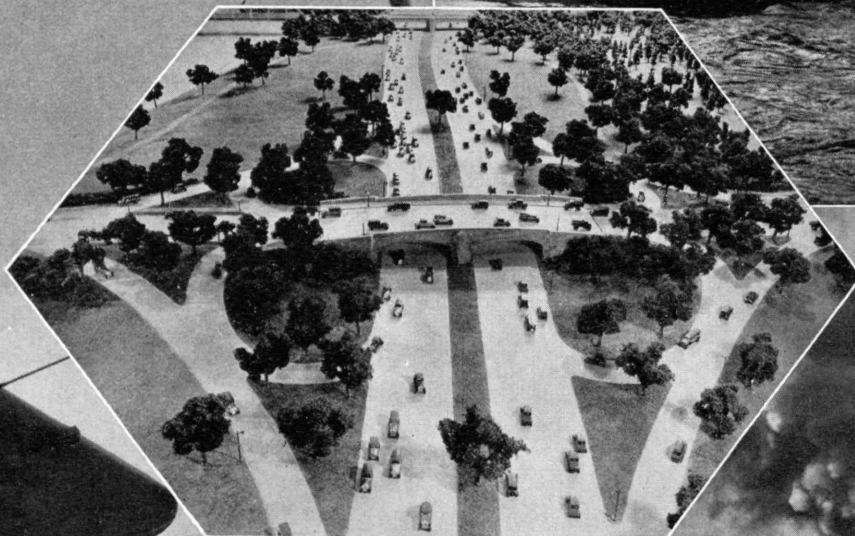
|   | PAGE |
|---|------|
| PATHWAYS OF TRANSPORTATION (INTRODUCTION) . . . . .   | 387  |
| By J. MONROE JOHNSON  |      |
| <i>Assistant Secretary of Commerce; Presiding Officer at the Conference</i>                                       |      |
| THE PROBLEM OF OUR COMMON CARRIERS BY WATER . . . . .   | 389  |
| By EDWARD P. FARLEY   |      |
| <i>Chairman of the Executive Committee, American-Hawaiian Steamship Company</i>                                   |      |
| HIGHWAY TRANSPORTATION . . . . .  | 393  |
| By EDWIN W. JAMES   |      |
| <i>Chief, Division of Highway Transportation, Bureau of Public Roads, United States Department of Agriculture</i> |      |
| THE RAILWAY OUTLOOK . . . . .   | 396  |
| By CHARLES D. YOUNG   |      |
| <i>Vice-President, Pennsylvania Railroad Company</i>  |      |
| CURRENT TRENDS IN AIR TRANSPORTATION . . . . .  | 401  |
| By EDGAR S. GORRELL   |      |
| <i>President, Air Transport Association of America</i>  |      |

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*(Delivered at the Massachusetts Institute of  
Technology Alumni Dinner, June 8)*

|   |     |
|---|-----|
| THE ENGINEER IN TRANSPORTATION . . . . .      | 407 |
| By JOSEPH B. EASTMAN                          |     |
| <i>Member, Interstate Commerce Commission</i> |     |





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# Pathways of Transportation

BY J. MONROE JOHNSON

*Assistant Secretary of Commerce*

CONSIDER it an honor and a privilege to participate in this splendidly arranged symposium and am grateful for the opportunity of hearing transportation problems, as related to the various fields, discussed by the able authorities whom I shall presently introduce.

While transportation is as old as he who was made in God's own image thousands of years ago, its major developments have come in the last 125 years. As recently as the close of the Eighteenth Century, world transportation actually did not differ fundamentally from that in the days of the ancients. Indeed, facilities for land travel utilized by George Washington were identical with the mode of King Solomon's day. On the sea the world's best ships were propelled by sails not unlike those used by the Pharaohs. Once the world became transportation-minded, however, as expressed in the demand for speed, comfort, and efficiency, improvements surged rapidly and every major one existing today, except the airplane, was perfected in the period of 1819 to 1901. New and startling advances are now daily occurrences. That is why our pride in the indomitable American spirit of progress and the corollary, genius, is stimulated when we review and contemplate the comparatively brief span of time that separates us from the birch-bark canoe of our aborigines.

Transportation acknowledges a debt of gratitude to the state of Massachusetts, one of the earliest abodes of our civilization. History properly credits this resourceful Commonwealth with much of the courageous and constructive pioneer work. Particularly is there a distinctly maritime tinge in the atmosphere here, hallowed as the destination of the sturdy Pilgrims. Likewise the vision and ingenuity of this state was a springboard from which railroad development acquired momentum, resulting in the modern rail network.

Transportation is the undisputed agency that blazed the pathway of American civilization through primeval forests, and was first projected over Indian trails. From the very beginning, our national development has followed in the wake of well-defined paths, carved by the demand for transportation. Indian traditions record that even before Columbus discovered America, necessity forced transcontinental movements from the Atlantic to the Pacific and from Hudson Bay to the Gulf. Their continuance in the hunter state, attended by frequent wars, compelled incessant movements. Tribal meetings, as well as tastes and search of food made the Indians preëminently a migratory, trail-blazing people. Few white men have equaled them in their instinctive sense of direction, or in their skill to observe the signs by which an obscure but direct and available pathway to the objective may be found. Despite the fruits of modern scientific knowledge, many of our present identical land and water routes, serving as arteries of modern com-

merce, were traversed for centuries by savage pioneers. Their trails carved out the lines of many of our common roads, highways, and railroads; their light canoes have been supplanted on river and lake routes by our modern steamboats.

While modes, methods, and facilities for transportation are transitory and involve many ponderables and complexities, designated paths are still basic factors in planning transportation on the land, as well as on the sea and in the air. Charted paths have always been the harbingers of progress and civilization, and our advance in their practical utilization has no counterpart in romance, drama, courage, and genius. The analogy between the primitive system and the modern is unique and interesting, and, but for the manner of regulation which we maintain over transportation's extensive path system, we can well imagine the utter maze of confusion and hazards that would impede and well-nigh stifle the movement of modern traffic. Coincident with the charting of new types of paths and the rising tide of transit, new problems of regulation in the interest of public safety are constantly being imposed. With competitive problems thus intensified, a trend toward coördination of all transportation in the interest of economy and efficiency seems not only probable but even unavoidable.

The earliest function of the railroad builders was the carving of suitable paths, an endeavor that engineering genius pursued by conquering natural barriers which earlier trail blazers had considered permanent hazards. The railroads reached their goal in the completion of a vast coast-to-coast network to which the public response resulted in the current density of traffic, requiring regulation; this fortunately has kept pace with development so that the vast and complex system now operates with amazing precision and responds to the modern demand for speed, comfort, and safety.

The development of our great system of highways, that gave impetus to the mass production of the automobile or *vice versa*, introduced additional responsibilities of regulation which were met with a system of traffic signals and various rules in the interest of public safety. Millions of automobiles, one to every five persons, are now utilizing a system of appropriately marked pathways, with such degree of safety as the travelers themselves elect to enjoy.

The ships of the sea have their prescribed pathways and while ocean transportation is almost as old as civilization, science has overcome practically all obstacles and hazards, even to making marked progress in fog penetration. Palatial liners ply the seven seas with their cargoes of human life, faithfully following paths charted for them in the same manner that primeval man and beast followed designated courses unerringly to their destination. A vast system of regulations like-



wise governs the mariner and his crew, and every known device has been invoked to safeguard life and property.

Finally, we have come to travel by air and have perfected aviation to a far greater degree and with far more safety as a practical mode of transportation than has any other nation. True to tradition, the giant airliner must also have its path, which is designated by compass and radio as well as by markings on land. The pilot was first guided by ground lights, but that system did not sufficiently remove the element of hazard, so American inventive genius again responded to a need created by demand for transportation and introduced the radio, enabling the air navigator accurately to visualize his course underneath or over the top, and follow the path day and night.

Notwithstanding the amazing advancement in air navigation, research laboratories are continuously experimenting with additional safeguards. It is a never ending process. Despite the age of transportation, modern improvements did not start until the close of the Eighteenth Century, and virtually every major improvement existing today, with the exception of the airplane, was perfected during the period of 1819 to 1901. As late as 1903, the first airplane was successfully demonstrated when the Wright Brothers negotiated their maiden flight at Kittyhawk Bay, N. C., and now, a third of a century later, scarcely a day passes that some new and startling transportation advance is not recorded. We have come to take our progress as a matter of course, and we cannot now be surprised.

During the recent celebration of National Maritime Day, our maritime history was reviewed from that eventful day in 1819 when the ship *Savannah* completed the first Atlantic voyage made by any vessel under steam. The sailing time from Savannah, Ga., to Liverpool was 27 days. That was an epochal feat and was the forerunner of the development that we have today. Now the Atlantic is spanned by palatial steamships in about four days and by Dr. Eckner's *Hindenburg* in two. Airplanes have cut the traveling time around the world to a little more than a week; some steam and electric trains can exceed 100 miles per hour; while racing automobiles have attained speeds of 100 to 200 miles an hour. The contribution in profit, knowledge, and pleasure which transportation has made to mankind is incalculable. It has turned the world into one great market and its people into one closely knit huge family.

We are now on the threshold of a new advance in ocean transportation, after having virtually lost our maritime prestige to foreign countries. Since the World War we have become woefully outmoded on the seas to the extent that only about 30% of our foreign commerce is carried in American vessels, compared with 90% in the Colonial period when our population was restricted to the Atlantic seaboard.

The coöperation of government with private initiative, particularly with reference to the rehabilitation of the American merchant marine, must continue until obstacles have been removed and our national needs have been met. Problems of equalizing costs for meeting foreign maritime competition must be approached realistically and in the broad national interest, without

selfish or political considerations. In this connection, it is pertinent to reiterate that no problems are solved by hysteria or by criticism born of prejudice. Recent verbal *sabotage* has tended to destroy the confidence of the American public in the safety of their own ships. Constructive criticism is greatly to be desired, for from the merging of many viewpoints comes helpful solutions, but no good purpose is served by the dissemination of destructive rumors. As to the safety of American ships, "Lloyd's Register" of England discloses that of ships of over 100-ton capacity of the ten leading maritime countries, the United States and Sweden tied for the lowest percentage of losses incurred during 1934 and reported up to June 14, 1935, although the United States operated six times as much tonnage as Sweden. Eight countries sustained greater casualties than the United States — the British Dominion leading with an approximate loss of one per cent of all its vessels, compared with a loss of only three tenths of one per cent for the United States. Furthermore it is also significant that the records show that the percentage of American seamen operating our ships has risen from 55.8% in 1928 to 80.6% in 1935, or five per cent more than statutory requirements.

I confidently believe informed public opinion favors a renaissance of activity on the shipping lanes of the world, and the coöperation and help of all patriotic citizens of the country will aid materially in reaching the goal toward which we are intently striving.

We must determine now whether we will have an American-built merchant marine manned by American officers and seamen, owned and operated by American citizens, filling the commercial and naval requirements of this great nation, or whether we will surrender the heritage of the sea, handed down by the founders of the Republic. Our present plight is not consistent with our record as the leading industrial and agricultural nation of the world. The history of our national progress is replete with triumphs over greater obstacles than those which confront our merchant marine now. The time has arrived to bring harmony out of conflicts through a procedure of businesslike allocations of Federal aid, properly administered. Such a policy I honestly believe will result in great savings to the American taxpayer and in the advancement of our rank among the commercial powers of the world, so that the American merchant marine may reflect the best traditions of worthy national achievement and assure us against the costly and dangerous plight with which we were confronted at the beginning of the World War.

Crews and officers must discharge maximum duty to the public, a fulfilment of contractual relations, and a patriotic interpretation of their duty as citizens of the United States. There can be no compromise with or deviation from these policies, ideals, and objectives.

Merchant ships must travel the seven seas to deliver our products and in turn bring us coffee and tea for our breakfast, rubber for our automobile tires, dyes for our clothing, and scores of other items which would not otherwise be available to us and the absence of which would transform and complicate our social and economic life. We are not only thus enabled to establish social contacts with our domestic neighbors, but to cross in-

ternational boundaries and cultivate mutual understandings with peoples of other worlds who have different languages, customs, standards, and philosophies. From these new relationships and the attendant understandings, transportation should prove a strong contributing factor to the perpetuation of peace and to permanent social and economic betterment and good will.

It is our history that problems are solved and progress is made under the influence of public demand. Transit advances have come in response to aggressive public sentiment. The public is quick to express its needs for more than it is getting, while, at the same time it usually manifests an unfriendly attitude toward innovations. Back in the days of antiquity, history tells us, chariots and the plainest types of carts and wagons were introduced probably without great public protest, but we do know that when the ancients "went modern" and made the initial move toward comfortable riding vehicles in the form of litters and carriages, the new devices were branded effeminate and men refused to ride in them. Thus for 15 centuries after the fall of Rome, men preferred to travel on horseback. Even in Virginia at one time it was thought unmanly to ride in the carriage. When private coaches were introduced in France and England, there was bitter public protest. Stage coaches were also criticized sharply, but were violently championed when the railroad first emerged. Pioneers in the

fields of the steamship, the canal boat, steam and electric locomotive, bicycle, automobile, and airplane encountered public opposition and even ridicule. Naturally, competition was a protesting factor, but other opponents visualized the horrors of possible accidents to such contraptions while carrying human beings. Once the people have accepted a new type of transportation, however, they usually demand a plentiful supply of it.

While it now seems incredible that the public will ever turn from present popular modes of travel, if there is anything in precedent, these may be destined in time to go the way of other forms of transit that were once enormously popular and indispensable. The marvels of today may be the antiquated modes of tomorrow.

We have come a long way from the sailboat days of the Pilgrims, but we have not reached the ultimate stage. The transportation situation calls for wise future planning, based upon careful research and intelligent approach. It calls for a continuing process of legislation in the interest of the welfare of the carriers and the public. We must develop a continuity of policy and of action. Transportation symposiums should be held throughout the country in order that there may be effectuated a coordination of the best thought on the involved problems. But you are here to listen to a discussion of the four fields of transportation by those most eminently qualified thereon and we must proceed to those important opinions.

# The Problem of Our Common Carriers by Water

BY EDWARD P. FARLEY

*Chairman of the Executive Committee, American-Hawaiian Steamship Company*

OUR merchant marine policy from 1917 to the end of the World War resulted in the United States Shipping Board becoming, by 1921, the largest shipowner in the world, possessing a fleet of over 2,000 ships. The control and management of this fleet, and of millions of dollars' worth of shipyards, dry docks, and other property was in the hands of men with little or no experience in shipping.

In 1914 the American Merchant Marine was almost wholly composed of coastwise ships, protected by law from foreign competition. American-flag tonnage carried less than nine per cent of the water-borne foreign commerce of the United States, as compared with 92% a hundred years earlier. The World War marked the opening of a new era, and the tremendous demand for war supplies increased freight rates to the point where ship-owning became extremely profitable. By 1915, all American yards were operating at capacity, and the price of ships had started its upward trend.

The withdrawal of foreign tonnage from our commerce created a shortage which seriously interfered with the efforts of American farmers and manufacturers to ship their goods. To cure this, Congress passed the Shipping Act of 1916. This Act created the United States Shipping Board and authorized it to purchase, construct, lease, charter, or operate merchant ships.

On our entry into the War, the Board created the Emergency Fleet Corporation and embarked on the most extensive shipbuilding program ever undertaken, with the result that new yards were built, and contracts for ships placed even in China and Japan. Everything was sacrificed to haste. Economy was lost sight of — over \$3,500,000,000 were expended before the program was completed. If the steel tonnage had been built at pre-War prices in American yards, its cost would not have exceeded \$650,000,000, whereas the actual cost of these ships was in excess of \$2,000,000,000. The difference of \$1,350,000,000 can be attributed to war costs.



When the Armistice was signed, relatively few of the ships contracted for by the government had been delivered, and the Shipping Board was suddenly faced with the problem of canceling or carrying out this large construction program, which, by this time, had been so accelerated by the stimulus of war needs as to give it a momentum that was difficult to control. Generally speaking, the policy pursued by the Board was to complete the contracts on which substantial progress had been made and to cancel those on which little or no work had been done. In following this policy, the Board was strongly influenced by the unusual demand for ship tonnage that continued after the cessation of hostilities. In July, 1920 — almost 20 months after the signing of the Armistice — the Board's construction program still called for the completion of 245 ships — nearly half of which had not yet been launched, and in the case of 26 of these, the keels had not even been laid.

At the end of the War, Congress again considered the question of maritime policy and it enacted the Merchant Marine Act of 1920 which makes this declaration of National policy:

... It is necessary for the national defense and for the proper growth of its foreign and domestic commerce that the United States shall have a merchant marine of the best equipped and most suitable types of vessels sufficient to carry the greater portion of its commerce and serve as a naval or military auxiliary in time of war or national emergency, ultimately to be owned and operated privately by citizens of the United States.

To achieve these ends, the Board was authorized and directed to sell its ships to United States citizens "as soon as practicable, consistent with good business methods." In making these sales the Board was required to take into consideration "facts or conditions that would influence a prudent, solvent business man in the sale of similar vessels or property which he is not forced to sell." The Board was also authorized to develop essential trade routes, and to operate its ships on such routes pending their sale or charter to private citizens. The Act further created a construction loan fund to encourage the building of the most modern and efficient types of ships in United States yards.

The collapse of world shipping which so closely followed the enactment of the Merchant Marine Act greatly complicated the problem of disposing of the government war-built merchant fleet. New steel ships, built at a cost of more than \$200 a dead-weight ton, were sold by the Board within 18 months after the passage of this Act at \$30 a ton. The wooden and concrete ships, which were built as part of the war program, had no economic value, and merely served to decrease the worth of the more useful types. Knowledge that the government would sell its ships served to depreciate the value of private tonnage. The construction of new ships stopped because building costs were out of all proportion to the cost of purchasing Shipping Board tonnage. These conditions greatly retarded the transfer of the government fleet to private ownership and resulted in the disbursement by the government of large sums each year in the operation of American-flag services in foreign trade pending their sale to private interests.

The possibility that such conditions might exist was not recognized in drafting the Merchant Marine Act. This legislation was enacted in a period of high freight rates and inflated values; the operation of American ships under these favorable conditions was profitable and, therefore, it was not considered necessary to provide the means for equalizing the higher operating and construction costs of the American owner with those of his foreign competitor, nor was any effective regulatory protection provided, either in foreign or domestic trade, against the destructive rate competition that was shortly to ensue.

It soon became evident that there could be no new construction for foreign trade by private citizens, nor could existing American ships continue to compete with foreign tonnage, unless the government, by grants from the public treasury, was willing to offset these handicaps and the subsidies paid by foreign governments to their shipowners. Realization of this led to the enactment of the Merchant Marine Act of 1928 (known as the Jones-White Act), which authorized the payment of a subsidy in the form of mail subventions to American lines operating on essential foreign trade routes. In return the contractors had to meet certain requirements regarding the size and speed of the ships and frequency of service. Since the enactment of this legislation, the Shipping Board has sold to American citizens a number of lines in foreign trade which were being operated for government account at a substantial loss. This loss for the 11-year period ending 1933 amounted to \$200,208,072. Moreover, 37 modern passenger and freight ships have been built in American yards and are now operating under contracts awarded under the provisions of this Act, and many others, bought from the Board, were reconstructed so as to make them more competitive units. The building of new cargo tonnage for domestic services has been virtually eliminated by the excessive number of government ships that have been for sale at nominal prices. These activities have gone far to reestablish American shipping in foreign trade.

The responsibility for administering the Jones-White Act was unwisely divided between two distinct branches of the government. Some criticism has been made of contracts awarded under this divided authority and it has been charged that they did not adequately insure against the diversion of the government aid to purposes other than those for which it was granted. The President has recommended to Congress a change from the present system of mail contracts to one of direct government subsidies authorizing the payment of excess cost of constructing and operating American ships. Efforts to reconcile widely divergent views on this subject have badly confused the present situation and rendered the outlook for the future uncertain. Today, for example, we are witnessing the strange spectacle of one government agency recommending legislation to aid in the building of new ships, while another branch requires qualifying speed trials for ships drawing mail pay which, if not unfair, are certainly drastic as compared with the requirements for the same ships when the mail contracts were originally awarded. When acts, such as the Jones-White Act, are passed, it is because of a generally recognized need for adequate government aid, and those

charged with its administration usually apply its provisions in a manner which they believe best suited to accomplish its purpose. Later, when public interest has lessened, there is a tendency to restrict its administration so as to endanger the end which it sought to accomplish. It goes without saying that the government should not condone any contract or arrangement which goes beyond the enabling legislation or which does not properly protect the government's interest. However, it would seem entirely possible that safeguards could have been incorporated in the existing mail contracts which would have prevented the charge that government money was used for any but the purposes intended.

The Shipping Act of 1916 contained provisions requiring that the rates of water carriers in domestic commerce be reasonable and nondiscriminatory and that schedules of maximum rates be filed with the United States Shipping Board. Rate or other agreements between water carriers, restricting competition in either domestic or foreign trade, were made lawful by Section 15 of this Act, provided such agreements were filed with, and approved by, the Shipping Board. The 1916 Act also prohibited unfair competitive practices. Some of these powers were amplified later.

Until the signing of the Armistice, no effort was spared in carrying out the construction program. After that, the cancellation of contracts, the adjustment of construction claims, the building up of trade routes, and the ultimate sale of the ships to private interests, were tasks of sufficient magnitude to absorb all of the Shipping Board's energies, and relatively little attention was paid to the regulatory provisions.

The Merchant Marine Act of 1920 was drafted at a time when the demand for shipping tonnage was greater than the supply, and ocean rates had in many instances risen to fantastic heights. Consequently, the weapons placed in the hands of the Board under this Act were designed primarily to insure reasonable and nondiscriminatory rates to shippers. Furthermore, it failed to give sufficient protection to the shipowner against the destructive competition which, although not then foreseen, so closely followed. This competition was greatly aggravated by the sale and operation of government tonnage.

So far as the domestic trades are concerned, this unrestrained competition manifested itself more particularly in the intercoastal trade — that is, the trade between Atlantic and Pacific coast ports, via the Panama Canal. This was due principally to the fact that the government war-built tonnage was better adapted for use in this relatively long-haul trade than on the shorter coastwise runs.

The history of this trade showed disastrous rate wars following periods of relative stability which were brought about by rate agreements among the lines in which rates were maintained either by the pooling of earnings or the granting of rate differentials. Each period of relative rate stability afforded opportunity for new lines to enter the trade by the purchase of ships from the government at a fraction of their cost and, by cutting rates, to divert traffic from the Conference lines, thus ultimately forcing the disruption of rate agreements to meet this competition.

In 1932 the Shipping Board took cognizance of this situation by proposing to Congress a regulatory act, known as S. 1963, which would have delegated to the Board regulatory authority over water carriers analogous to that exercised over railroads by the Interstate Commerce Commission. Out of this recommendation there finally resulted the enactment of the Intercoastal Shipping Act, 1933. This Act required the filing of the actual rates and practices with the Board. Since its enactment, there have been no rate wars in the intercoastal trade.

The rapid expansion of water and highway transportation since the War, has caused the railroads to request Congress to relax the regulation of their rates in order to enable them to compete on equal terms with unregulated water and highway transportation. Congress, confronted with the necessity of reconciling the conflicting interests of the various forms of transportation to the public welfare, recognized the need for recommendations on this subject from a source removed as far as possible from selfish interest. To this end, it enacted the Emergency Transportation Act of 1933, creating the office of Federal coordinator of transportation, and to this office the President appointed the Hon. Joseph B. Eastman. After an exhaustive study, Mr. Eastman recommended a program of coordinated regulation of competing forms of transportation, centralizing the regulatory authority in a reorganized interstate commerce commission. One of the bills recommended by him provided for the regulation of domestic water carriers, and another for motor carriers. The latter bill (S. 1629) was enacted into law in 1935, and the former is still before Congress. The coordinated regulation of competing forms of transportation in the public interest would seem to be the logical and sound solution to the railroads' demand for equality of opportunity. Nevertheless, the railroads are insisting that the "Long and Short Haul Clause" in the Transportation Act of 1920 be modified in order that they may compete more effectively with water transportation. Such a modification would no doubt result in destructive rate competition between water and rail carriers, with consequent losses to both. Neither the Interstate Commerce Commission, nor the Coordinator, favors such a change.

The necessity for rate stability in foreign trade has not been sufficiently emphasized. Government subsidies alone cannot develop a merchant marine. Frequently, their effect is nullified by subsidies granted by other nations, resulting in an international competition from which no one benefits. The maintenance of fair and stable rates is essential to the development of an adequate merchant fleet and greatly reduces the amount of government aid required to accomplish this. In drafting the 1916 Act, Congress had in mind accomplishing this through Shipping Board approval of conference agreements, as evidenced by the following summary from a Congressional Committee report:

Practically all steamship representatives who testified before the Committee, as well as a majority of the leading American exporting and importing firms who expressed their views on the subject to the Committee, contended that shipping agreements, conference relations, or oral understandings which steamship lines have effected among themselves in



nearly every branch of our foreign trade are a natural evolution and are necessary if shippers are at all times to enjoy ample tonnage and efficient, frequent, and regular service at reasonable rates. Such agreements, it is contended, are a protection to both shipper and shipowner. To the shipper they insure desired stability of rates and the elimination of secret arrangements with competitors. To the shipowner they tend to secure a dependable return on the investment, thus enabling the lines to provide new facilities for the development of the trade. Furthermore such agreements are held to furnish the means of taking care of the disabilities of the weaker lines, whereas unrestricted competition, based on the survival of the fittest, tends to restrict the development of the lines and in the end must result in monopoly.

In the same Act, deferred rebates were prohibited, thus nullifying the stabilizing effect of conference agreements in a period of surplus tonnage. This has deprived the American shipowner of the principal means used by foreign owners to maintain stable rates and to defend themselves against cutthroat competition in other than American trade routes. Largely because of this, our foreign trade has suffered more severely from rate wars than has the trade between other nations. These violent fluctuations in rates have disrupted our trade and resulted in severe losses to the shipowner. The deferred rebate serves the interest of both shipper and shipowner, and there would appear to be no sound reason why the American owner, alone, should be prevented from dealing effectively with destructive competition.

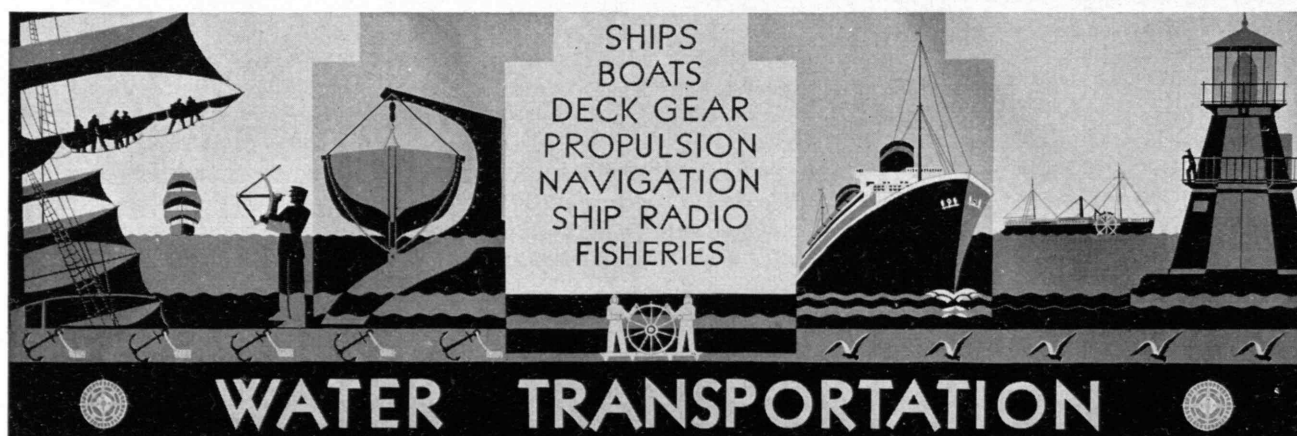
In 1933, the United States Shipping Board was abolished and its duties and functions were transferred to the newly created United States Shipping Board Bureau of the Department of Commerce. While the Department has exercised its regulatory and other powers in an efficient and forceful manner, nevertheless, it would seem desirable that its quasi-legislative and semijudicial functions be delegated to an independent commission not charged with responsibility for developing our merchant marine.

Probably no form of commercial activity is as involved in its relations with the government as is shipping. A shipowner must comply with the regulations of nine government departments, exercised by more than 25 separate bureaus and divisions, as well as those of 10 independent agencies of the government. Congress, at the present time, is considering a number of bills designed to supplement the regulations already in effect. Some of these are largely the result of a disastrous fire at

sea which occurred in 1934. All such bills should receive careful consideration and should be acted upon with calm judgment rather than in a punitive spirit. American shipping men, responsible for large investments in ocean-going tonnage, cannot and do not countenance slipshod or dangerous methods of operation. They would be the last to seek to protect the occasional operator who refuses to maintain proper standards. The very fact that shipping, with its numerous inherent dangers, has been so successful in preventing serious accidents, serves as a strong endorsement of the men who have managed this branch of American transportation.

It is evident that progress has been made in the development of our merchant marine since the War. Nevertheless, it still carries little more than a third of our water-borne foreign commerce. American shipping in foreign trade must depend on government aid and, therefore, the public interest in its continued maintenance, and further development must be demonstrated beyond any doubt if such support is to be given consistently. It is difficult to see how this can be accomplished without a comprehensive survey by a competent and permanent commission, since only by such a study can all the factual data be developed which Congress should properly require in legislating for shipping.

Water transportation, both domestic and foreign, is a facility necessary to industry and agriculture that should be furnished at reasonable cost and without discrimination. The history of American transportation by water demonstrates that no carrier, however efficient, can earn a fair return on his investment until unfair practices have been eliminated and reasonable rates established with some degree of permanency. Experience also shows that voluntary cooperation through conference provides only temporary relief, because the conference may be abandoned or its regulations secretly or openly disregarded. Furthermore, non-conference members are almost certain to enter the trade at the first sign of profitable rates. An admitted chaos calls for a remedy. The effective means of establishing stable conditions in a trade and maintaining fair and reasonable rates on a permanent basis is through government regulation. Such regulation should be placed in the hands of an independent commission. This body should be free from partisan considerations and should have no interest, direct or indirect, in any proceeding which may come before it.



*Museum of Science and Industry, Chicago*

# Highway Transportation

BY EDWIN W. JAMES

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THE subject of highway transportation is about as broad as the face of the earth, as long as history, and as deep as civilization — yet I am allotted half an hour for its discussion! I might spend the entire morning giving you a brief history of road building, or delivering a treatise on the evolution of the wheeled vehicle. I might expatiate on highway transportation as a phase of military strategy. I might philosophize upon highways as an index to civilization or wax prophetic concerning the future of the motor vehicle. I might read you tables of statistics relating to freight and passenger movement by highway or even present a brief on the legal issues involved in the public use of the roads. Actually, I shall touch on a number of these questions, but shall confine myself to American experience and current problems.

Speaking generally, we may say that highway transportation is the first step in going anywhere, and the last step in coming from anywhere. Goods start for market over the highway, and are delivered to the consumer by the same medium. To an increasing extent even the long-distance transportation of persons and property is now by road for the entire trip. This universality of highway transportation puts it in a distinctly different category from any other medium of transport. The roads are common property. Subject only to restrictions in the interests of safety, protection of highway structure, and prevention of exploitation, the highway is free to all.

Highway transportation in this country has passed through two very distinct phases, and is now in a third. These are the prerailroad era, the railroad and canal era, and the automobile era. The first two of these are history, and we can study them with a fair perspective, albeit through a haze of romance. The last is so new, pervades all of our activities in so great a degree, and in its newer manifestations has been developing so rapidly, that it is not easy to evaluate it comprehensively or even justly.

The early history of intercolonial intercourse and of subsequent western expansion is a history of wagon roads. In the course of events the steam railroad made the Conestoga wagon and the Concord coach obsolete, first east of the Mississippi, then, with the resumption of industry after the Civil War, westward to the Pacific. Until the beginning of the present century, the highways were of local interest only: for neighborly intercommunication and for access to railroads, rivers, canals, or seaports. The long-distance intersectional travel was by rail or water. The famous highways of history — the Cumberland Road, the National Pike, the Santa Fe and Oregon Trails, and a host of others — slumbered during the middle period until the motor vehicle started the wheels of commerce rolling over them once again. Fascinating as is the story of transportation during the

Eighteenth and Nineteenth Centuries, I must forgo the pleasure of dwelling upon it, for it is Twentieth Century conditions and possibilities that I wish to discuss with you at this time.

The new era in highway transportation, destined in the light of history to be as far-reaching and romantic as any in the past, is the era of the motor vehicle. It has been made possible by the invention of the internal-combustion engine and the pneumatic tire; which of these has been more important would be a fair subject for debate. One need not be old to be able to review in his own adult lifetime the entire practical development of the automobile and "good roads." The bicycle first created the demand for improved road surfaces in the "Gay 'Nineties." The automobile found these roads to its liking and intensified the demand, but — much more important — the automobile soon proved that it actually could go places. Its radius of operation extended beyond its own immediate neighborhood. Good roads were not enough if they went only in disconnected scraps to or by the property of whoever had most influence with the road authorities. To secure the full benefit of the motor car we had to find a way to connect these many bits of new road into continuous routes. The Federal Aid Act of 1921 recognized this need. Federal aid to the states for highway construction had been initiated in 1916, but in 1921 it was definitely provided that Federal aid funds could be expended only on a limited system of highways, to be mapped out in advance and approved by the Federal government. This system was limited to a maximum of seven per cent of the total public rural-road mileage in any state, a percentage which it was estimated would provide for the interconnection of all important cities and county seats with at least one north-and-south, and one east-and-west road in each state.

We now have the improved system of highways that we set as our goal 15 years ago. Practically speaking, we can now go anywhere in this country by automobile, at any time. Our only difficulty, if any, may be met in traveling the last few miles to our destination over unimproved local roads. We have the greatest system of highways the world has ever known, yet I am confident that we are only at the beginning of our new era of highway transportation. The highways have made for themselves an important place among the agencies of travel and transport — not wholly without challenge, but unquestionably secure. Whether at the moment we can define this place in satisfactory terms is not particularly important. The fact that such a place exists is evidenced by the facts that we have built a large, correlated mileage of highways in response to a universal demand and that these highways are being used daily by millions of vehicles in the carriage of passengers and freight.



Highway transportation, with all its subsidiaries, is our biggest industry today. We have in this country about 3,000,000 miles of rural highway, of which nearly ten per cent is improved with some sort of surfacing to make year-round travel possible. Of 324,312 miles of primary state highways at the close of 1934, there were 109,691 miles improved with "high type" surfaces. Forty-six per cent of the Federal Aid System is now surfaced with high-type pavement, and only ten per cent remains unsurfaced. Expenditures during 1934 for state highway construction, maintenance, and administration (exclusive of interest and amortization payments) totaled \$909,659,000 — nearly a billion dollars.

Using these highways are 26,000,000 motor vehicles, including more than 3,500,000 motor trucks. The wholesale value of new motor vehicles, parts, and tires in 1934 was \$2,500,000,000. It has been estimated that in recent years 5,000,000 or 12% of those gainfully employed in the United States, have been employed in the manufacture of motor vehicles and supplies, the construction of state and Federal highways, and the driving of trucks and busses. All of this has grown from a truly infant industry in the course of 30 years.

Where do we go from here? Certainly we cannot and will not stay where we are, if for no other reasons than that our highways are annually taking a toll of 36,000 lives in traffic accidents or that highway competition with other agencies of transportation has become a national issue. We are paying an incalculable price for the inadequacy of our highway management and operation. These are still as far behind the potentialities of the motor vehicle, both in relative efficiency and completeness, as they were 25 years ago.

Let us consider some of the major responsibilities that confront us: Our main roads are passable but by no means adequate, either for safety or for freedom of efficient use; our local roads are hardly out of the horse-and-buggy stage of development; the economics of highway taxation and finance are still a virgin field of study; finally, the regulation of highway transportation as a public utility faces us as a major administrative problem.

Our main roads are passable, but on how many of them can a modern motor vehicle be used safely to anything like the extent of its capabilities? So rapid has been the development of road transport that much expensive highway construction has become obsolete almost as soon as it has been completed. This inadequacy of our main highways manifests itself in two ways: an appalling toll of accidents and a less spectacular but seriously wasteful restraint on vehicular movement due to congestion or conflicting demands.

The most immediate problem of highway transportation at this moment is the safe use of the roads. Expressed in terms of 36,000 deaths annually, serious injuries to perhaps a million men, women, and children, and a property damage that we cannot even estimate, it challenges our best efforts. Accidents happen sometimes because of defective or neglected mechanism in the vehicle, sometimes because of poorly designed highway or improper roadway surface, and sometimes because the vehicle operator is reckless, careless, or lacking the physical or mental ability to handle a powerful

vehicle safely. Usually several of these factors combine; the typical accident happens when a less-than-perfect driver finds himself in a more than ordinarily hazardous situation.

The reasons why our progress toward highway safety has been so slow are several: First, the multiplicity of accident causes is so great that we cannot yet with confidence say what is safe and what is dangerous in highway design and traffic regulation; second, despite convincing evidence as to the safety of certain expedients, we are forced somewhere to compromise with cost, and must depend on the motor-vehicle operator to make reasonable allowance for the shortcomings of the highway; third, the major responsibility for safety must in the last analysis rest on the highway user, that is to say, on each of a hundred-million persons, more or less. Nevertheless, we can and must find ways and means to achieve the safety that our railroads and many industrial plants have achieved by unremitting effort. Traffic accident statistics are reasonably complete and accurate in very few of our states. In only 12 states is it required that accidents be reported to some centralized state authority. Few states have made any attempt to analyze in detail the combinations of circumstances under which accidents occur, or to refer the individual accidents to the particular spots at which they occur, with a view to applying local remedies. Numerous cities are doing excellent work, both in accident recording and analysis, and in the development of safety programs.

Outside of correcting conditions at points where accidents have been frequent, our practical problem is not so much to discover what will make an absolutely safe road, as to balance degrees of safety against the highway budget. We know, for example, that divided roadways and separated grades at intersections reduce our accident risks, yet such expedients are too costly to warrant their use at present on any but our major highways. We know that modern highway lighting systems will prevent many serious night accidents as soon as we can find the funds for their installation.

On our lesser roads we must do the best we can with less complete protection: liberal lane widths, well-designed shoulders, painted center lines at hazardous points, and warning signs. Regulatory measures must compensate for deficiencies in physical safeguards, and the highway user must accept the responsibility for driving with reasonable care.

Closely akin to accident hazard on the highway is the delay due to inadequate highway facilities. We cannot expect to travel at all times at speeds equal to those possible on the most modern rural highways, but we can hope to remove some of the obstacles to free flow which now exist. Much of our present delay must be incurred in the interest of safety, hence up to a certain point the same highway improvements will serve both of the ends sought: safety and the saving of time. Wider highways, for example, permit each vehicle to keep to its own most efficient or preferred pace, passing slower vehicles freely and without hazard — a consideration of particular importance in hilly country. Various types of parkways, elevated highways, or other "freeways" provide facilities for travel unhindered by the congestion and hazard that cannot be avoided where access to abutting prop-



erty is permitted or where intersections at grade occur in their usual abundance. Intersection designs, especially for major traffic routes, have been developed to eliminate all need for one vehicle to cross the path of another.

The second major problem that demands immediate attention is the improvement of our 2,500,000 miles of local roads. Some of these might well be incorporated in the major highway system. Most of them, however, are to be regarded as "land service" roads, individually of purely local interest, collectively of fundamental concern to all of us. Now that we have our network of improved main roads we must see to it that our rural population has year-round access to those main roads. Recent legislation has made Federal funds available for the improvement of local roads. As an initial step toward the more effective use of these and other road funds, the United States Bureau of Public Roads is cooperating with the highway department of nearly every state in making, for the first time, an inventory of all highways, with a study of the traffic on each. When we have this detailed information assembled we shall be able to classify our highways on the basis of their importance, and establish a program of progressive improvement.

The economics of highway construction and maintenance I have mentioned as the third of our major problems. Highways cost money — about a billion dollars a year exclusive of city streets. In earlier times men worked on the road with their neighbors, or paid toll for traveling improved turnpikes. We see some survival of both these institutions still, but for the most part the technicalities of road construction and the advantages of modern road machinery have made it impractical for the farmer to work out his road tax and, except for numerous toll bridges (many of them publicly owned), all roads are equally free. The only source of highway revenue, other than tolls, is taxation. To be fair to all, and to develop all sources of taxation most effectively, we must learn a great deal more about where our highway dollar comes from and how it is spent. The incidence of taxation, particularly of the special highway users' taxes, must be compared with the allocation of the benefits of those taxes. The property tax, though still the mainstay for local road construction and maintenance, has practically disappeared as a source of revenue for state highways. The through routes, used principally by traffic that in no way concerns or benefits the local property holder, are financed by gasoline and motor-vehicle taxes and by general taxation. The problem goes deeper than this, however. Are the various classes of highway users paying special highway taxes in proportion to the benefits received by them? Do, or should, heavier vehicles pay directly in proportion to the extra cost of providing them with heavier and wider road surfaces? Do the city dwellers pay more than their share of the gasoline tax allocated to rural highway construction and maintenance? One of our most serious concerns just now is the growing tendency to divert the proceeds of the gasoline tax, originally intended for highway purposes alone, to other ends.

The United States Bureau of Public Roads in cooperation with a number of the states is making a detailed study of this taxation problem. In addition to a careful

analysis of state financial records, data are being gathered from representative samples of motor-vehicle owners, to measure road usage by the different groups.

Finally, I come to consider the question that is uppermost in the minds of most of us: the problem of regulating highway transportation as a public utility. The practical problem is so to develop this means of transport that it will be of the greatest possible advantage to the country as a whole. I have already remarked that the mere fact of the existence and current growth of highway transportation establishes its clear case for "public convenience and necessity." Like any public utility, however, regulation is necessary for the public interest.

The conflict of interest and opinion as to highway transportation lies in the fact that there exist also other means of transport between points on land that are definitely competitive with the highways: coastwise marine shipping, river and canal transportation, the railroads, and, most recent, the airplane. All of these represent large investments and a wide distribution of security holdings. Any change that threatens partly or wholly to supplant any of these necessarily demands the most careful study.

Each of the several methods has its advantages and its limitations. These advantages and limitations are the fundamental bases for any division of the transportation field. They are not absolute: They vary with a multitude of geographical and physical circumstances. Nor are they mutually exclusive: In many fields there is a wide choice of transport available. A given journey may be made by road, rail, air, or even water, the deciding factors often being largely psychological on the part of the traveler. All four kinds of transportation can and do exist side by side between competitive points. Similar alternatives are offered for the movement of freight, the choice between them depending more definitely on economic considerations. We cannot solve the competitive situation by definition, nor can we do it overnight by heavy thinking.

I think we can agree that some degree of regulation of highway transport is necessary if competition with other transportation is to be kept within economic bounds. This is particularly true of commercial transport. There has been general agreement that the private passenger car shall move freely and unrestricted, regardless of state lines and subject only to ordinary registration requirements and traffic regulations. The motor truck, on the other hand, has generally been classed as a commercial vehicle and often subjected to special regulation and taxes, particularly in interstate traffic. Vehicles carrying passengers or freight for a consideration, and so using the highways as a place of business, are everywhere put under some sort of permit or franchise restrictions.

Surveying the whole field of highway transportation with reference to future possibilities, there are three major efforts that must be made to secure full accomplishment. The highways must be made safer and operation must be sufficiently controlled to assure safer use. This effort will be directed toward a study of present conditions of alignment and correction of hazards of all kinds along the present improved roads. It will cover the whole field of driver qualifications, traffic rules and

regulations, and motor vehicle licensing and registration. Work is already being done in both lines of endeavor by the Bureau of Public Roads, the states, and other interested agencies.

The second major effort necessary to develop full possibilities of motor transport is to determine its economic place in the entire transport regimen of the country. Obviously, highway and rail transport impinge upon each other more directly than highway and any other form of transportation, and fixing the most advantageous and economical relationship of these two is the purpose in view. The matter is not simple of solution, as I have already implied; it has serious pitfalls in the way of general losses to investors, capital requirements of the railroads, existing law and established and often too inflexible practice. It seems clear, however, that there are elements of the problem that may at once be largely or entirely removed. There is first that large phase of highway transport, both of passengers and goods, that in no way has competed, and will not compete with the rails. This is the service to small population centers and settled rural areas which the railroads have never reached. This field, properly served by the highways, may become a heavy contributor to railroad traffic. At the other end of the scale is a certain class of traffic which belongs naturally and economically to the rails and probably will not change. This class of transportation covers all long-distance movement of bulk commodities. Between these two elements lies a third, debatable, competitive, and still awaiting adjust-

ment. The future of highway transportation requires determination of economic and practicable relations with the railroads under competitive conditions. It would be a daring man who at the present stage would venture to outline a definitive plan in this field. It will be one, in all probability, of long and gradual development.

Finally, there is an effort needed, which is now under active promotion, to carry to its logical state the service to small population centers, and to settled rural areas, which constitutes unquestionably the legitimate field of highway transport. This effort will be directed toward the extension of improved highways into the regions not now adequately served. How far this extension is to go depends in the immediate future on present available funds; it will be a continuing process, planned to meet the growing and changing requirements of rural development. The details affecting the expansion are numerous and varied. They will not remain what they are today, for there will be increasing and decreasing justification in different areas. The work will affect not only the roads of secondary importance, but as these are increased in number the main roads will have to be enlarged in capacity to accommodate the greater traffic. As this process continues, our country as a whole will become more and more inviting for rural habitation, the way will exist for a more uniform distribution of rural population, and the work will not be finished until our population has become stabilized — a point in the future which no one can forecast.

# The Railway Outlook

BY CHARLES D. YOUNG

*Vice-President, the Pennsylvania Railroad Company*

**W**E are living in a dynamic era. Social and economic conditions are rapidly changing. Rapid transportation and mechanical communication are so universally part of our daily life that the present generation talks with more people and hears and sees more of the world and its events than was possible in the combined scope of two or three generations before the present era.

One effect of this change is the tendency of our people to become segregated into more sharply defined economic groups determined largely by their vocations, and as these groups grow they become more distinct but more dependent upon each other. Transportation and communication are the facilities which serve this interdependence.

Water and rail are old types of transportation; motor highways and airways are relatively new. The messenger and the mail preceded the telegraph, but now by means of the telephone and the radio more is accomplished in one day than was accomplished in a year a few generations ago.

What is the future of the railways in this situation? Are they to be superseded? The answer is, emphatically: No. Are they to be correlated with other forms of transportation? Yes, and a forecast of the immediate future shows very clearly that the change is in the direction of progress as regards every field of transportation service.

What is the motive power of the future? Steam? Yes, probably propelling direct and by turbogenerator. Why? Because of its further possibilities of economy and efficiency. Diesel-electric? Yes, for certain classes of trains, and for switching purposes where steam, for reasons other than for propulsion, is not desirable. Electrification? Yes, in dense traffic territory, both underground and on the surface and for all classes of service. Will the passenger car change? Yes, largely in the direction of comfort to the passenger and of increased esthetic appeal. The trend of freight car design will be toward specialization in service and greater average capacity. Freight trains will be longer, will move faster, with fewer intermediate stops at freight yards, thus eliminating time loss and expense, as railways are consolidated.

The remaining yards will be more extensively mechanical in their operation than in the past, with less shock to lading and equipment.

Speed of trains will increase — competition will see to that. The extent to which speed has already been increased in recent years is seldom realized. Lightweight materials will be utilized as their use is justified by the cost. The riding qualities of the track will be improved, principally at turnouts and by changes in or elimination of rail joints. There will be fewer but larger local stations and coördination with highway vehicles serving the intervening territory. Signaling will be improved by the extension of the cab signal system and reduction in wayside indications. More train dispatching will be done by centralized control of signals, thus replacing the dispatcher's telegraph key and telephone. Freight containers, truck bodies, truck trailers, and trucks loaded with their commodities will be moved in freight trains for distances beyond the economical limit on the highways. Collection and delivery of freight will be universal — that will come for passengers, too.

We see many improvements ahead resulting in better service, ultimately at lower cost, and that means, of course, money must be spent for these betterments. While these improvements to expedite the movement of traffic and eventually lower the cost of transportation will change the kinds of labor employed, the greater volume of traffic attracted will increase rather than diminish the total railway employment.

How do I know all this? I don't. It is a judicious estimate from the trends of the times; it is more accurate than a guess. For the fact is that the whole railway outlook today so far as management is concerned is one of progressive betterment of service and equipment.

My assignment from your distinguished chairman, however, as I view it, does not stop with this forecast summary which is only part of the picture of railway development. It is desirable that we know how it contributes to the welfare of the public.

The usefulness of a man to society is measured by his achievements. The usefulness of an industry is measured by the quality of its product, the place that product occupies in our daily life, and the contribution it makes in lifting the standards of living. The usefulness of the railway is measured in all of these ways. Its policies are determined by men of vision and force. It serves the public in times of stress, through prosperity and adversity. Many features of service can be rendered satisfactorily only by the railway. It has a greater variety of contacts than any other industry. It serves the humblest passenger, the farmer, the worker in forest and mines, the industrialist, the banker, the Federal and state governments. An industry which received nearly three-and-one-half billion dollars in 1935 from the public for services, and paid almost two billion dollars in wages, over one-half billion dollars for materials and supplies, and one-quarter billion dollars in taxes must occupy a vital place in the lives of the people and it deserves a substantial portion of their thoughtful consideration. The record is one of progressive accomplishment.

Since railways have grown with the country and enabled the country itself to grow during the past 100 years, the physical development of the two have followed

parallel lines. The railways were the trade routes. Industrial expansion has followed trade routes: Mines were opened when they could be reached by railways; cities expanded when served by railways; manufacturing plants were placed at suitable points between sources of supply of raw materials and the markets for their finished products, because of the knowledge that the railways would adequately serve both requirements. To perform their service, industry and railways built up enormous capital structures, each depending upon the other for sufficient earnings to justify the investment. Those interests therefore became so firmly interlocked that any fundamental change in the economic system generally could not fail to affect the railway and its security holders, specifically.

We are too close now to the changes that are occurring, and the observation of their effects has been too limited by time to enable us to draw accurate conclusions as to their real nature and ultimate results. However, there are certain trends which may be useful in our efforts to anticipate future conditions which the railway must meet: (1) The inclination of the public to avoid advance purchase commitments. When the decision to buy is reached, shipments are wanted at once. (2) The desire of the public for increased speed and comfort in passenger travel and the obvious need for greater flexibility and speed in freight service. (3) Movements toward the regulation and coördination of all forms of transportation and other public utilities; the competitive urge, however, is essential for progress and must not be disregarded. (4) A definite movement toward the consolidation of facilities and services of railways with railways, and of railways with truck and bus operations. (5) The modernization of plant and equipment. (6) Public demand for a reduction in total transportation costs, regardless of the kind of transportation used. (7) The revision of the financial structures of railways for the purpose of reducing fixed charges and obligations no longer self-supporting. (8) The substitution of cheaper or more appropriate forms of transportation on branch lines where existing service is not profitable.

What is the railway doing to meet the objectives of those trends? In the first place we should know something about the financial resources of the railway. On the capitalization side we have in the past by legislation, regulation, and public demand for safety, and to avoid delays and congestion, forced them to expend capital for facilities and equipment. This maximum investment made with the approval of the regulatory authorities must be sustained and if not utilized by the public it is a loss to the security owners. With this necessary investment we must inquire in good and bad times what the railway must do in meeting expenses, taxes, and fixed charges, and then how much is left for dividends, profit, or betterments. Obviously, unless a profit on an operation is realized or is in prospect, there is little hope of attracting capital for improvements. It is imperative for their growth that the railways maintain their credit.

The operating ratio — which is the measure of operating efficiency — for all Class I railways of the United States in 1935 was 75.11, in the face of increased costs of labor and materials. The railways prospered during many years in the past with a higher ratio, but the gross



earnings were greater. This shows that management has been able to control operating expenses, yet, because of reduced gross earnings and higher overhead costs imposed by legislation, taxation, and regulation, the remaining margin that should exist to maintain net income—the final result upon which railway credit rests—has been growing less. A revision of the financial structures of many railways is one of the predictions that can be made with reasonable assurance, unless there is a substantial and continued improvement in their traffic. The more expeditiously this transitional phase of the railway credit position is corrected, the better for the industry.

Only three general methods of improving the situation financially seem to exist: 1. *Make further reductions in operating expenses.* Careful studies show that, while smaller economies are currently made, the big opportunities are isolated, will require time for accomplishment, and are inevitably accompanied by adverse effects upon the values of adjacent property, upon the earnings of labor, and upon the earnings of those affected by the reduced buying power of labor. There is abundant evidence of the fact that, within the limits of its power and consistent with its responsibilities to the employees, management has already been aggressive in effecting operating economies, and meeting the requirements of its employees.

2. *Reduce fixed charges and taxes.* This is now being accomplished chiefly where receiverships and reorganizations are in progress, the primary purpose of which is the forced reduction of fixed charges to a figure which seems justified by earnings. This forces the distribution of losses uniformly among security holders, possibly taking away from securities a financial return which has been regular and fairly certain and substituting a speculative return based on possible future earnings.

3. *Increase gross earnings.* It is this method that offers the challenge that railway management welcomes and accepts—a challenge which compels the adoption of the most ingenious devices and methods that science and engineering in the hands of management can produce to give the public a useful and attractive service. Then the results of the working of the natural law of the survival of the fittest will become evident in transportation. The public is usually quick to respond to service well rendered, and ready to pay a fair price for it.

It would be folly to attempt to predict the details of the popular form of transportation of the future, or to plan definitely, far in advance, radical changes which might violate the principles of sound railway operation, but it is possible to show briefly the ways in which the railway is endeavoring to anticipate certain changes in the transportation needs of industry and the desires of the public at large.

An evident change in mental attitude during the past decade is that brought about by the more rapid exchange of communications and the expansion of industry. The consumer wants no idle capital tied up by delayed transportation and no divided responsibility from the time the order is placed until delivery is made at his door. He wants to mail or telephone his order and receive his goods with as few intermediate processes and as expeditiously as possible. The order may involve a 100-

pound shipment or a 100,000-pound shipment; a successful transportation system should be prepared to meet that demand. Experiment has developed the railway container service, the rail-truck pickup-and-delivery service, and the road rail car to meet the demand in a practical way, and yet that need has been met only partially. Further coördinated research work is required, including marketing and distributing methods generally and an appropriate tariff for the service. It is a reasonably safe prediction that whatever outstanding accomplishments are developed in transportation to meet a future public need, will be developed through a coördinated research group including railways, manufacturers, universities, institutions, and governmental departments equipped to make appropriate studies.

One of the anomalies of today is that so little realization seems to exist as to the extent of present railway research. Literally thousands of men are engaged in the kinds of research on railway problems, which if they were undertaken by younger industries would be widely acclaimed, but since they relate to studies for reduced operating costs and for continued safety, rather than for styling and selling value, little is heard of them. The fact is that research has become an established, continuing factor in the railway industry—so productive, indeed, that its results today are remarkable, yet are accepted as commonplace.

The desire of the public for speed and comfort is definite and unmistakable. Increased speed on the railway, however, is not simply a question of developing motive power that will run faster. It means improving the track structure, reducing curvatures, revamping signal systems, protecting or eliminating highway crossings, and many other changes. Because of the expenditure necessary and the time required to prepare for it, substantial increases in sustained speeds for regularly scheduled trains will come gradually. There is reason to believe that the increased comfort of the passengers will receive in the future as much attention from the designers of railway equipment as it now receives from the designers of automobiles. Changes in that direction not only may be expected—they are on the way.

As suggested by Dr. Harold G. Moulton and associates in that very comprehensive book entitled "The American Transportation Problem," industry will tend to decentralize outside the densely built up sections of metropolitan centers to secure better labor conditions, lower taxes, and other advantages. It is, therefore, conceivable that freight terminals serving congested areas will be so relocated and the truck used to transport the lighter freight from the shipper to the terminal and from the train to the consignee.

Experience continues to be our best teacher. We may build up attractive theories about the way we should travel, the standard of living we should enjoy, and the way our freight should move, but in the final analysis methods are used which experience demonstrates are most satisfactory for society generally, and for which the public must be willing to pay. It is still a case of trial and error or trial and success.

A testing of the fitness of the various forms of transportation is now proceeding right here in New England where much pioneering has been done for the past 300

years. It is particularly fitting that New England should be a territory in which the relative merits of the various forms are being determined, and it is because we are today gathered here in Cambridge that I am using the situation in New England as a text for this part of my remarks. The experience gained here will be useful in fixing transportation policies for the country to meet the needs of the future.

With regard to water-borne transportation: The ports of New England have furnished facilities for its development, for determining its cost, and for demonstrating its practical value. As evidence of the trend of water-borne traffic through the ports of New England, it is interesting to note that ten of its largest ports showed an increase of 30% in tonnage during the decade ending in 1934 — a period when the value of the output of industries of New England decreased 52%.

With regard to highways: Geographically, New England covers the extremes from a densely populated zone, some 75 miles wide along the coast, to the sparsely populated areas of northern Maine, which fact permits a test of highway transportation under widely varying conditions. In this zone of greatest population are highways joining cities and towns where the motor truck, motor bus, and private automobile are the most popular instrumentalities for local transportation of passengers and freight — where the hauls are short and the service frequent.

Railway branch lines, constructed before the internal-combustion engine became practical in transportation and permanent highways were constructed, are now being abandoned in that territory, not, however, because they were an economic waste. They served a definite purpose in the development of the territory and their construction was justified. They illustrate, however, the hazards that fixed capital is constantly incurring of meeting competition from a previously undeveloped scientific discovery which the ingenuity of the engineer later makes useful to society.

New England, for example, is a territory in which the manufacturing industry has been developing through many years — over a longer period perhaps than in any other section of the United States. With that industry have been developed groups of workers skilled in tool making, textile dyeing and finishing, boot and shoe manufacture, silverware, and many other lines of work, who have their homes in New England and want to remain there. Yet because of the growth of population westwardly and the growing competition of similar industries in other territories, it is more and more difficult to keep industries in New England operating on a profitable basis.

New England cannot consume all that her factories produce; she must reach markets outside her boundaries. Therefore, it is imperative that access be had to transportation facilities which are suitable for long hauls, preferably by competitive routes. The alternative is a decline in New England industrial prosperity and the loss of the trained personnel which has grown with the industries. The same need exists for transportation facilities for bringing the raw materials and supplies from their sources to the industries. It has been estimated by Professor William J. Cunningham of Harvard

University, in his chapter on "New England's Prospects — 1933," that for every three carloads of manufactured products moving west from New England, five carloads of raw materials move east into New England.

Due to the competitive urge, the railways of New England built up passenger and freight terminal facilities in order to attract business to their respective lines. The cost of terminal operation is one of the largest elements of expense to railways and that cost must be absorbed in the road haul. If a railway has a short road haul and an expensive terminal in which the business originates and another expensive terminal in which it is delivered, it is perfectly clear that such a railway is handicapped against one with a long road haul between terminals. Where such conditions exist it is essential that those railways be consolidated or affiliated with railways having long hauls over which their terminal costs may be distributed. Where this relationship does not exist and they make a rate which is high enough to cover their road and terminal costs, that rate is so high that the traffic is lost by the railways to cheaper forms of transportation.

The type of transportation planned for the future requires not only a consideration of the survival of present transportation systems and of the diversified institutions whose investments therein are at stake; it involves also the future economic welfare of these New England states, whose population must be served in such ways as to prevent economic disturbance and to keep the highly skilled worker in his home environment. New England conditions are typical of those in most of the middle-eastern coastal states, which are already feeling the effects of the growth of population westwardly and the competition of industries more favorably situated in regard to sources of much of the needed raw materials, markets, labor, and the social conditions under which labor may be employed.

It occurs to me to suggest that the London Passenger Transport Act of 1933 may be a directional sign for a portion or for all of New England in rationalizing the present conflicting modes of transportation and the regulatory bodies in the several New England states. Under this Act the London Passenger Transport Board has given an outstanding example of progressive action in making use of the advantages of various forms of transportation by coördination in a densely populated area. The plan adopted has to do with the urban and suburban handling of passenger transportation in London, and while all of the details might not fit American methods, it is cited as an example of coöperative action in a highly complex transportation situation taken in the face of great difficulties. The principle might very well be studied as to its applicability to New England and its environs from a freight and passenger point of view.

A comprehensive study of the American railway situation was made by the Coolidge Committee, composed of eminent Americans, appointed to recommend a "solution of the railroad problem, as an integral but the most urgent part of the entire transportation problem." Their report made in 1933 said, among other things: "The railroad system must be preserved. It is the most important single element in our social and economic



life. . . . Unprofitable railroad services should be replaced by cheaper alternative transport methods." That is what an able national committee said. That committee obviously had in mind the thought that present conflicting modes of transportation should be coordinated and each made to render the service for which it is best fitted.

New England cannot disregard its sources of raw materials nor its markets for its finished products. Therefore, the transportation system which unifies its own interior problems and at the same time provides for transportation connections with the balance of the country must be recognized as of paramount importance for New England's prosperity. Such connections known to New England as existing rail traffic gateways should be continued, the volume moving through each to be determined by the service of the route. The difficulty is to maintain those gateways in conjunction with a unified New England transportation system without slowing up the movement in making the interchange between railways.

Concentration of traffic through certain of the gateways is helpful in eliminating loss of time in effecting interchange. With the decreasing of the time element, by eliminating yarding, New England would be served by a continuous flow of well-expedited traffic. It is highly desirable that more of those through routes be under either unified supervision or management in order to avoid divided responsibility, which is a handicap to expeditious movement.

The railways are and will continue to be the backbone of the transportation body of our country. Ships, trucks, busses, private automobiles, and airplanes have their places. The effort of railway management now is to determine the place the railway best fits in the transportation body, then to concentrate on making that part function in the best possible manner. This will require not only the joint efforts of the scientist, the engineer, and the economist to find the possibilities, and managerial ability of a high order to convert those possibilities into useful functions in the public interest, but also a like attitude on the part of competitive transportation so that the two may be coordinated and give the best

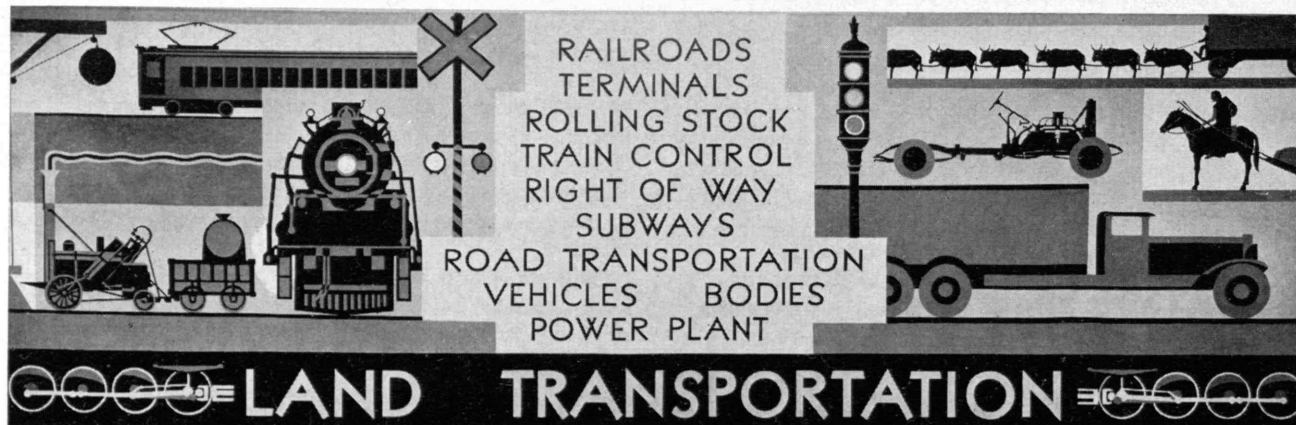
service at the lowest possible cost. The railway industry has those talents today and is at work on these questions.

It must be borne in mind that the public is always impressed by the new and the spectacular. Old methods and devices, even when they continue to serve us well and to advance with us, are taken as a matter of course and seem colorless. The passenger automobile, the bus, truck, and airplane are new and still in the developing stage. There is novelty in their design and romance in their operation. They have an irresistible public appeal during their growing period. Like the Easter bonnet, they have yearly models. The railway, notwithstanding its consistent progress, is a commonplace facility in comparison and its advantages as a transportation agency are not surrounded by the color of the younger competing forms.

The railway is rendering a valuable public service that must be continued. No substitute has yet been developed that will as a whole perform the same service in any better way. The future points to a coordinated system of land, water, and air transport which the railways are in a position to accomplish because they are the backbone of the transportation structure. They should be relieved of existing restrictions preventing ownership within the rail industry as well as in other forms of transportation. They should also be relieved of the existing hit-or-miss plan of governmental regulation and control without corresponding responsibility for the results, financial or operating, or the effect upon relations with labor, or labor itself.

The railways face the future with confidence and if governmental regulation and direction will follow principles of a broad and sound policy, the changing public demands and economic conditions can be met by the rails through the ingenuity of the experienced engineer and the skill of expert management. Thus, the coordinated transportation of the future will equal or excel that ever produced by the railways.

The railways are a necessary unit in a coordinated system of transport and until something else comes along to take their place, they will be the backbone of the transportation structure in any and all sections of our country.





# Current Trends in Air Transportation

BY EDGAR S. GORRELL

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THIS subject embraces the whole range of human, economic, and scientific relationships. Miss Dorothy Parker in reviewing the dramatic efforts of a certain movie star wrote: "She covered the whole gamut of human emotions from A to B." That is approximately as far as anyone may hope to proceed in this complicated subject within the time allotted to me.

Beyond question, the air transport industry comprises three main aspects — one to an extent greater than most other industries: economic, political, and technical. This is not the order of their importance; in this industry, unfortunately the relative importance of one to the other varies from time to time. Always we wish we could forget about the political aspect, but perhaps it is well for us that we have had this, for in some ways it has accelerated development. Sometimes the very extreme hardships placed upon the industry by political expediency have hastened rather than retarded economic and technical development. There is not much question that the limitations placed upon Germany by the Treaty of Versailles accelerated the development of technically and somewhat economically sound commercial aircraft in that country. The German aviation industry immediately after the War had a definite set of rules to follow and laid out its designs and production in accordance therewith. I believe we need a rule book and reasonable assurance that it will not be changed drastically without notice. The transports in current use, for example, were designed to make money under a set of rules which do not apply today. This is one reason why we have had to seek means of financing new equipment.

I shall take up the subject of economics first — current trends in the economics of air transportation. At the present time approximately 30% of the revenue of United States' air lines come from mail; the 70% remaining comes from passengers and express. It has been said that in Europe 80% of the total operating revenue of air lines comes from the government. Our service is better, faster, more comfortable, and safer. Passenger-mile statistics indicate that the European air lines are but one tenth as safe as all our air lines in the aggregate. In spite of our enviable operating record, the air lines of the United States lost \$4,000,000 during the last fiscal year; for the calendar year 1935 this was reduced about one half. Considering revenue received by the government from the sale of air-mail postage, the so-called subsidy to the domestic air lines during the last fiscal year was under \$3,000,000. Certain air lines received less air-mail pay than the government received for the postage sold and used over their lines. In other words, these mail carriers are subsidizing others that do not carry the large loads. It is logical and fair that the smaller air lines have contracts, and this is something which we hope will be straightened out without disad-

vantage to the public and the industry. But it is a knotty political-economic problem.

Many of my fellow Alumni of M.I.T., thinking of the romance and the future of this industry, probably envy men who are in it. Do not jump to conclusions about this. We have a maximum limitation on the compensation any individual connected with a company in our industry can receive, the like of which is contained in the laws of no other land nor does it apply to any other industry in this country. On the other hand, there is a minimum salary which our industry may pay to certain of its high salaried personnel — the pilots. As a consequence, some of the most intelligent men in our industry remain as pilots. The president of one air line flies a regular run and is paid over \$700 a month as a pilot by a company that cannot afford to pay him what he is worth as an executive. The maximum compensation feature of our legislation limits any officer, director, or employee to compensation from any air-line company source in excess of \$17,500 a year. The law makes it a crime for any individual employed regularly in this business to exceed this figure as his compensation from any company. If we want to hire a business expert or a Kettering to solve certain serious and difficult business or technical problems — and we have them — we cannot do so unless patriotism inspires the individual to give up his other and normal income in order to accept a paid position or consulting assignment with us. Directors worthy of and commanding much greater incomes than the \$17,500 figure are not available to the air lines. We have some extremely brainy and capable directors now, but how long can they be kept in the industry under our present legislation? This is something we are endeavoring to straighten out. This legislation was punitive, for reasons I shall not go into here. The indications are this situation may be relieved at least in some measure.

Reverting to the pure economics of our business, without the political (although it is difficult to discuss one phase without the other), the air lines are at the present time running at greater capacity than ever before in their history. From certain cities, particularly New York, Chicago, and Washington, it is now necessary to make reservations for certain schedules one or two days in advance. Using the average monthly figure of revenue passenger miles for 1935 as 100, the revenue passenger miles index for March of this year is 126. This is a very favorable indication of what is yet to come — and these capacity loads on certain of our schedules came to us shortly after our recent accident in the Alleghenies, during which there were air-transport passenger fatalities for the first time in ten years of service over these mountains. But even with this heavy traffic the transports cannot be full 100% of the time — due to mail scheduling, and other factors — and we are unable yet to show a profit. More than any other form

of transportation are we limited in space and weight. Unlike the railroads, busses, trucks, steamships, and to a certain extent even private automobiles, we cannot load our vehicle to accommodate safely an unusual volume of traffic, in order to help offset those trips when the traffic volume is light.

With regard to competition with other means of transportation, I have what I hope will not be construed as a "Pollyannish" attitude. I am convinced that there is room for all four media of transportation — rail, steamer, bus, and air; one supplements the other. We should be, and I hope are, friendly competitors. Our success will help the other media to succeed and apparently some of the surface carriers need help as much as we do.

A practical example of this air-line aid to other businesses took place in my personal experience several years ago: As the head of an automobile concern, I used Pan American Airways extensively in developing a certain South American market. Directly traceable to this, the sale of automobiles there increased fourfold. This immediately caused increased domestic labor, material purchases, rail shipments to the seaboard, and heavy loads of ocean freight.

It is getting so now — a definite current trend — that business men have to use the air lines in order to compete with firms in the same field of business which do use them. When this happens, the railroads, and even the busses certainly profit. The railroads, steamships, and busses have not, as yet, felt competition from us to any material extent. Our percentage of the total passengers carried is still under 2% of the traveling public. We aid many people to travel who would not do so otherwise due to the time element. This is true of vacationists who have but two weeks and would stay at home or drive their automobiles to nearby resorts, were it not for the services of the air-transport lines which allow them to visit distant home towns, resorts, and national parks within the two-week allotment. We have thus created additional business for the steamship lines, in that a traveler may fly to a seaport, take a steamer through the Panama Canal, and be back home within almost the two-week period. I know a Chicago bank official who recently started out on a two months' world tour, using rail to the West Coast, steam to the Dutch East Indies, and the air lines over a portion of Asia. If he had not used the air lines his world-tour vacation would have been impossible because of the time limitation. Instead, he probably would have driven his car to New England for the two months. Automobile executives and engineers, paradoxically, are among the best class of customers the domestic air lines have. There are, however, many occasions when they find rail service and automobile more convenient for specific trips. These few examples indicate that "there is room for all four."

There is unquestionably a stimulus and influence which our industry has had upon other industries. One angle which has always amused me is the trend of Seaboard Airline Railroad stock which many investors and speculators still consider to be that of an aviation company. If I remember correctly, this stock took a rather mysterious course several years ago when air-line and aviation manufacturing stocks were following a similar

trend. It may also be pertinent to mention the manner in which railroads, automobiles, and even gas ranges, desk sets, and multitudinous other articles are now streamlined.

Few people realize that the air-line industry of the United States has been in existence but a decade. A century ago land transportation was to water transportation what air transportation today is to surface media. Today the air lines carry luxury articles large in value but small in bulk, as well as the passengers whose time is valuable. One important fundamental difference exists between air transportation and other forms. In some countries where, for any reason, rail, highway, and marine transportation have not as yet been developed, air transport has filled and is filling the entire transport need. In those parts of the world heavy freight is carried by airplane at less cost than possible by any other means. We have examples of this in South America and the Antipodes.

When our first highway was started people were skeptical whether land transportation would exist long enough to be a serious competitor to water transportation, feeling that they could not bear the expense of land carriage. Certain individuals still feel that transportation by air has as doubtful a future as was predicted for transportation by land at the time of our country's beginning.

All transportation systems have been victims of false starts. The railroad, as originally instituted, was expected to run upon an open country highway. The development of steam power made possible successful commercial two-way traffic on our waterways. The railroads required more than 30 years to obtain the mileage to which our airways grew in less than one-third of that time.

Just as economy and safety of all modes of transport depend upon the aids the government has constructed to help them, so also does economy and safety in air transport depend upon the Federal navigational aids which the government, by the 1926 Act of Congress, is presumed and supposed to construct and maintain — not alone for scheduled flying but also for the private flyer and the Army and Navy. In the early days of all transportation systems, success has been greatly hampered by discriminatory taxes and unduly burdensome governmental legislation. This now threatens our air-transport system which is already handicapped by too many regulations upon which the strangle hold of taxes is growing each year. The aviation industry, including air transport, has had over 20 Congressional investigations since 1919 — an average of more than one a year.

It is to be marveled that we make progress in spite of handicaps which no other industry, to my knowledge, has experienced in such a concentrated degree. The notoriety attendant to these investigations creates unwarranted doubts in the minds of the public about the safety of air travel. This fear complex I believe to be our "number one enemy" rather than the railroads or the busses, even though they sometimes take advantage of it by advertising: "Use the blank rail or bus line, with peace of mind, and be sure you get there."

In spite of this adverse publicity, passenger travel has increased from 5,782 passengers carried approximately 1,500,000 passenger miles in 1926, at an esti-



mated passenger revenue of \$155,000, to 840,000 passengers carried 350,000,000 passenger miles in 1935, at an estimated passenger revenue of about \$18,000,000. The average length of the trip of a passenger by air has increased from approximately 225 miles in 1926 to over 400 miles in 1935. In this interim of time, passenger fares have been reduced a little over 50%. We cannot charge much less with our present equipment than our present rates which average about five and one-half cents a mile. If we did, our losses would be more than they are now. Average direct operating cost of our airliners, not including sales expense, liability insurance, or other administration overhead, is between 28 and 38 cents a mile; this is for our present equipment of 10 to 14 passenger capacity. We must receive regularly about twice this 28- to 38-cent figure per mile in order to break even; therefore, rates for some time to come will not go down appreciably.

There are two ways of counteracting the fear complex: One is not to have accidents. We are working toward that end strenuously and with all means at our disposal. Fundamentally (though some will disagree with this statement) the airliner, due to its use of an additional dimension not available to surface media, is now technically, and soon will be practically, safer than any other means of transportation. It already exceeds in safety, by about twofold, cross-country travel by one's own private motor car. Life insurance actuaries are responsible for this statement and a more conservative and difficult to convince group of men never lived. We have solved the technical problems of landing in fogs; the question is now one of getting the funds to purchase the necessary equipment and expand and improve our air terminals. The airplane will, ere long, be the only method of transportation which can reach its destination on schedule under all conditions of weather. At Pittsburgh during the recent flood, air transport, for a rather extended period, was not only the sole means of transportation but the sole means of communication until radio and telephone equipment was delivered by plane. During the severe snowfalls in the Middle West this past winter the air transports arrived and departed on time and with comfort to the passengers, while the crack trains were hours late — one in particular, for the first time in history, skipped a scheduled departure. These statements are not made with braggadocio; they merely show what has happened under unusual circumstances and what, within the realms of technical practicability, the near future holds in store. Financial realization is another thing.

The air lines are facing the need for additional capital. They are handicapped in this by four factors: (1) Unwarranted fear complex, the answer to which I have already mentioned. (2) Governmental policy. We need a definite, more permanent one, so there will not be the drastic upsets and setbacks experienced during the past several years. In this connection, I should mention the valuable contribution made to the nation by the Federal Aviation Commission, of which our mutual friend and instructor, Dr. Jerome C. Hunsaker, '12, was a member. In 1934 this commission, appointed by the President, worked intelligently and diligently. Its report, although not as yet adopted in its entirety, is

considered by thinking people to be a handbook or guide on American commercial aviation policy. Certain of its recommendations are being followed. I prophesy that, with certain modifications (not in principle, however), the commission's report will stand the test of time. (3) Limitation as to compensation which may be received by any one connected with the industry. This is contradictory to the American principle of fair play and honest reward, and undoubtedly will be corrected. (4) Need for airway aids and better landing facilities such as are provided by the Federal government to the water carriers and all others using harbors, rivers, and seacoasts, whether or not they be in the commercial transport business. The air is an ocean which has no boundaries nor coast lines. It is the only ocean or highway navigable to all points of the earth's surface. Oftentimes this fundamental is lost sight of.

The international phase should not be overlooked. Just as the railroad proved the most promising agency of the last century to handle the transportation needs of the American people, so in this century will the airplane prove the transport means of carrying our citizens to our far-flung frontiers. In the Nineteenth Century, our Federal government, our states, and our cities were most generous in the subsidies they granted for the construction of our railroads to, and beyond, our frontiers. So far, the present generation has not seen fit to encourage airway aids in our territories lying beyond our continental limits. The millions of square miles of virgin lands in territories such as Alaska, that invite the American pioneering spirit, would more quickly be opened to our people were our Federal government to do its duty and provide funds for aeronautical usage.

In considering rules and regulations and in considering the installation of navigational aids, our government should realize that the air is this great ocean I have previously referred to, and should make provision for the navigational aids which will make possible the accurate and safe navigation of this great ocean to all points in which this country is economically interested. Commercial aeronautics, as we know it today, was made possible by the tremendous technical advance that took place when billions of dollars were spent on the technical phases of aeronautics during the World War. Aviation does not stand alone in this respect for war-time energy likewise gave new growth to inland and foreign water transportation.

In studying the history of commercial air transport, the unbiased citizen cannot help but realize that the air transport industry owes to the Post Office Department a tremendous debt for their vision and the initial impetus given this struggling young industry. The Department of Commerce also has made valuable contributions.

As one of our outstanding air law experts states the case there are three choices ahead of us as to the trend of future legislation:

1. Assume that the present Federal aviation policy is sound and leave it alone.
2. Assume that the present form of government control is basically unsound and seek to change it.
3. Assume that the present policy is unsound, yet seek to change it only after careful study, possibly during the next Congress.



So much for the economical and the political aspects. We now turn to the scientific and technical viewpoints in which the M.I.T. Alumni are perhaps most interested. The engineering progress of the future will be towards using greater power from lighter engines using less fuel. We should be able to get greater speed and greater range of operation from the same amount of fuel, yet double our present carrying capacity when we design our future aircraft. Cost of operation will, thereby, decrease.

Probably the most interesting and significant technical development of recent years in any form of transport has been the contract let several months ago by five air lines for an experimental model of a four-engined, 40-passenger transport. The air lines joining in the financing and development of this experimental plane are: American Airlines, Eastern Air Lines, Pan American Airways, Transcontinental and Western Air, Inc., and United Air Lines. The resulting finished product, of course, would be available to other air lines at a cost considerably less than otherwise possible. This marks the first time the air lines have consolidated the experience of their engineers, pilots, and technical and traffic advisers to develop an experimental plane to meet the needs of the future and obtain an airliner with sufficient carrying capacity to insure profitable operation.

The signing of the contract followed months of conferences between the air lines and leading aircraft manufacturers to whom specifications were submitted and from whom bids were received. Specifications call for a plane weighing 25 tons fully loaded, with a top speed of 230 miles per hour and a cruising speed of 193 miles an hour, using 60% available power. The plane will have a wing span of 140 feet, an overall length of 95 feet, and a height of 20 feet. There will be four 1,000-horse power engines. The landing speed is not to exceed 65 miles an hour and the plane is to incorporate the latest features of design, construction, and navigation aids. The passenger cabin will be 40 feet long and 10 feet wide, fitted with 20 upper and lower berths with separate dressing rooms for men and women. The plane is to be capable of carrying 20 passengers and two tons of express and mail on long-distance flights, and on shorter trips 40 passengers and cargo can be accommodated. The present 10- and 14-passenger transports will not economically care for the business in prospect for 1938 when the four-engined type plane will be in service, if it meets specifications.

Approximately half a million dollars will be required for the one complete experimental airplane. If each of the five air lines had separately undertaken development of such an airplane it would have meant an additional expense to the air lines of approximately \$2,000,000 — the cost of four additional experimental airplanes. It is apparent that even if five experimental airplanes had been started simultaneously, the performance, as shown by the plans of different manufacturers, would have been substantially the same. The \$500,000 cost of developing the one experimental four-engined airplane and the subsequent cost of approximately \$200,000 to \$250,000 per airplane, could be accomplished only by the joint enterprise of these five

air lines. The scope of the undertaking is such that individual development of this project would have sapped the financial resources of any individual air line.

The resulting product — and this is of major importance — will be interchangeable between air lines. In this the air lines have torn a leaf from the railroad book, in the latter's interchangeability of Pullman and freight cars. The peak season for New York-Florida traffic is the slump season for other routes. In the summer, the New York-Miami operation does not require, nor can it use profitably, the transports needed in the winter. That operator, therefore, can lease the uniform transport plane during peak season from one having a surplus of equipment and *vice versa*.

Progress is so rapid in this business, that this pending four-engined Douglas, before it is in operation, will probably be made obsolete by the design of some other manufacturer. I am convinced that "putting all the eggs in one basket," as in this case, will stimulate rather than retard design and construction of different and advanced types of airliners. The standardization of parts and accessories in the new Douglas will be an appreciable factor in keeping costs down.

Dependability is more important than speed — speed is useless without it. Scheduled trips lose their meaning if the airplane cannot keep up with the clock the year round. Adequate structural strength and dependability is the first virtue of an airplane. An airplane must meet, and does with complete safety, the worst strains it is likely to suffer. The science of designing aircraft and aircraft engines has for years been so advanced that structural failures practically never occur. Such interruptions as do occur are usually caused by minor accessory failures rather than by structural failures.

Although all development of any new form of transportation, and in fact all new developments themselves, are subject to possible hazards, the public accepts these hazards as a part of the price which must be paid for all such forward steps. We must so conduct our research and our experimental work that the probability of a repetition of an accident will be reduced to a point which, if not vanishing entirely, may be considered as acceptable in comparison with the promise of useful service.

Airways and airports are, of course, necessary adjuncts to the airliners. Airways, incomplete in their construction, have been federally provided and maintained with but few exceptions. It might be well to define just what these facilities are fundamentally: An airway is a route commonly used in air travel, usually officially designed, mapped, marked, and provided with some aids to air navigation; an airport is a landing field intended for regular use as a transfer point between air travel and travel by land or water, and provided with the necessary facilities.

Since these airways are utilized almost entirely for the facilitation of interstate commerce and for the use of private flyers and the Army and Navy, as well as air transports, it is proper that the Federal government continue to provide these facilities rather than to depend upon states and municipalities or private enterprise. In Great Britain there is a law to the effect that

no one but the national government can install or operate an air navigational aid. The greater number of airports in active use in this country are owned and maintained by public bodies. Many of those built in 1927 and 1928 are unsuitable today for commercial operation. One of the big national problems of the early 1930's was "how to grow corn on concrete highways." Now we find that some of these runways are of insufficient length for the new transports. Some of them have had schoolhouses and other obstructions built at their ends, making them useful only when conditions are favorable.

The American conception of a developed airway now includes a carefully mapped route with a sufficient number of emergency landing fields, spaced at intervals of approximately 50 miles, complete set of beacon lights (now of but little use), facilities for guidance by radio beams, and facilities for the collection, transmission, and broadcasting of local weather information.

The miles of lighted airways in operation have extended from approximately 2,000 miles in 1926 to over 22,000 miles at the present time, and lighted intermediate landing fields have grown from 92 in 1926 to over 260 at the present time. The airliners daily fly over approximately 28,000 miles of Federal airways of which 6,000 miles are not equipped with Federal airway facilities. Such equipment as does exist on the 6,000 miles is owned by the operators themselves.

The licensing of teletypewriter circuits along the airways to transmit weather and other information was begun in 1928. From zero miles of teletypewriter lines the system has grown to over 12,000 miles.

The development of radio range beacons to direct pilots under adverse weather conditions was carried forward by the Department of Commerce and reached a point justifying general installation in 1929. Range beacons have grown from approximately nine in 1929 to well over 100 in use at the present time.

The construction and operation of airways as a possible field for action by state governments has been discussed for several years, but only two states have made efforts to provide airways. Reduced appropriations and an economy wave brought the construction of airways to a complete standstill at about the end of 1932, but some small amount of construction has taken place since that date, almost all being financed from funds allocated to the Bureau of Air Commerce by emergency agencies such as WPA and ERA. Approximately \$11,223,298 has been expended for construction along the Federal airways, but this does not mean and should not be interpreted as being the equivalent value of the airways. Much of the existing airway equipment, particularly radio equipment, has a high depreciation rate. Some of the equipment that was installed five, six, and eight years ago, has naturally become obsolete. It is estimated that approximately \$14,000,000 is immediately required to bring the domestic airways up-to-date without giving consideration to emergency landing fields.

The weather reports furnished along the airways are the result of cooperative work between the Bureau of Air Commerce and the Weather Bureau. The expenditures by the Weather Bureau have decreased approximately 30% in the last five years, even though the volume of flying has greatly increased.

The military usefulness of the airways is of primary importance. They greatly increase the ease and speed with which our military air force can be concentrated and shifted from point to point within the United States. The airways are thus of pronounced military value, regardless of the amount of peace-time use they may receive by military flyers.

Not every city can be located upon the ocean or upon an inland waterway, but every city is located upon that one great ocean of air which is navigable to every point on the earth's surface. Some 1,300 airports are now in use in the United States, about 200 of which are used by scheduled air lines. Airports are an important phase of the public works activities of municipalities and attention should be given to the proper position, size, and condition of airports in Federal programs of aid by public works. Investment of public funds in municipal airports now totals approximately \$100,000,000. The number of municipal airports was declining in 1932, doubtless due to the efforts to reduce expenditures during the depression, but since that date, an impetus has been given to the development and construction of additional airports from funds of CWA and WPA.

Great care should be exercised that this work is done well and along lines which will make the airports usable, not only when the projects are completed, but in future years. In this the WPA, coördinating with Bureau of Air Commerce airport engineers, has done wonderful work. By slight revision of the regulations to allow these projects to be accomplished under contract, relief labor might accomplish the work at lower cost and allow it to be done generally on a more economical plane. Good airports are just as important as good airplanes.

There seems to be no disposition on the part of this nation to deny that air transportation — as a promising new form of transportation — should receive some special aid until it reaches a greater degree of maturity. Eventually, of course, the air-transportation industry will be self-sustaining. Adequate transportation facilities of all kinds are important to national defense but air transportation has a special importance, differing in kind from that attached to other forms of transportation. The fact that the airplane is a weapon as well as a vehicle is not denied.

The future of air transportation is full of speculative elements, and planning for that future offers opportunity for wide difference of opinion even among the best informed. In such cases, the great significance of air transportation from a national defense standpoint must be given weight, even though national defense should not be the primary object in planning for civilian industry, even for air transportation.

Service along the busier air lines is being differentiated into express and local service, with attendant classification of airplanes into express and local stops. This development is due partly to increased traffic and a consequent desire to improve through service, partly to new equipment now coming into use, and partly to refinement in the technique of air navigation. Improved design has increased the ratio of cruising to landing speed and has extended the range of aircraft. Air navigation technique has advanced greatly during the last two years. Emphasis has been laid upon the develop-



ment of high-altitude flying to attain maximum speed and efficiency in flying. Higher altitude for cruising requires longer distance between stops. The tendency on through service is to avoid stops at intervals of less than 400 miles, and within the next two years, express airplanes may stop only every thousand miles or so. Local service at intermediate points will continue and become intensified on the heavier traffic routes. We are fortunate in having excellent planes for both express and local classes of service both in present use and under development.

Nonscheduled flying during the depression years declined as did also the number of airplanes in operation in private flying. Although the safety record in private flying has grown a trifle, it has remained with but little improvement over a period of the last seven years, while the safety record of scheduled flying during that same interval has shown a tremendous improvement.

The busier metropolitan airports will eventually be reserved for the exclusive use of the scheduled air lines. The concentration of miscellaneous commercial and private flying around air-line airports increases the type of hazards which the air lines cannot control and which interfere with the safety of scheduled arrivals and departures. Private fliers complain about this, feeling that the air-line companies are forcing them off certain airports. What is protection for one branch of flying is protection for the other. What would the future of motor boating be, if a small outboard motor boat hit the *Queen Mary* causing her, as well as the motor boat and its crew, to sink?

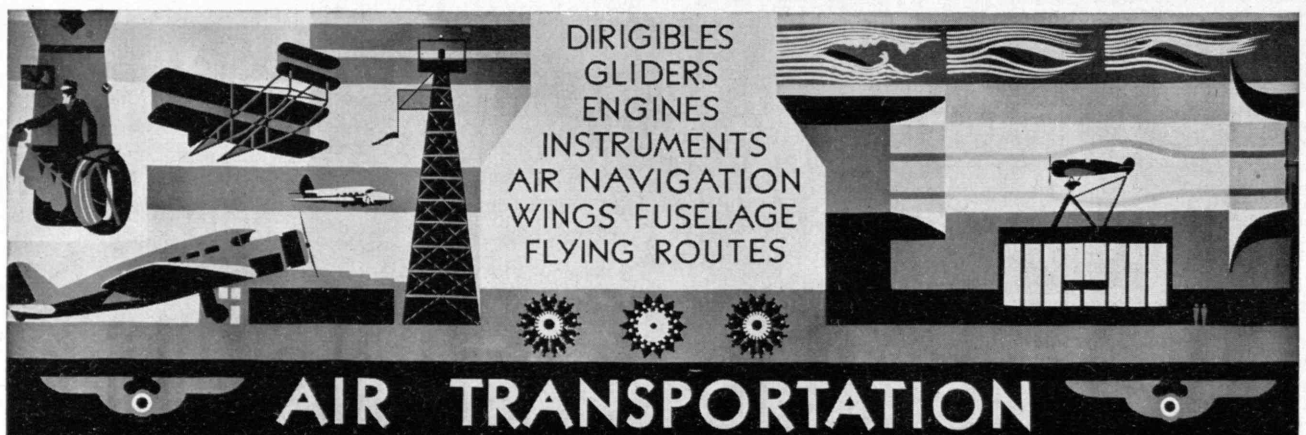
Airways have not kept pace with air-line expansion. The technique of flying is ahead of the airway aids. The ground radio installations are even now out of date in many instances. It is necessary to install tower antennas to replace the loop type which subject the beams to swinging. To provide "stand by" equipment for emergency use is fundamental. Traffic along the airways has increased to such an extent that the question of air-traffic control is an important current problem. A perfected and workable system, with which our chairman, Colonel Johnson, is familiar (for his department gave us valuable coöperation in its development) is now used at the main terminals and airways between. This provides, by means of predetermined flight plans, for complete and continual check as to positions of all planes

along the airways. A traffic coördinating officer on the ground, who keeps track of the position of airliners, gives instructions when necessary through air-line or airport radio as to movements when planes get dangerously close together.

Present facilities are available at air-line expense to the private and military flyer. The Department of Commerce now has an appropriation to take over this work so that there will soon come into existence the needed governmental authority over airway movements. It is necessary that a central governmental authority administer this traffic control, for it involves interstate commerce and there are many interests including the Army and Navy which in peace time are subject to the traffic coördination.

In this talk all I have been able to do is cover some of the high spots. In an attempt to draw these spots together I am going to tell you a little story — a true one: A 72-year-old Chicago man left his home city not long ago and returned three weeks later. He had traveled 17,000 miles. He visited in San Francisco and Los Angeles, returned to Chicago, traveled to a point in New Jersey, went to Frankfort, Berlin, Rome, Paris, Brussels, London, and New York, and returned to Chicago. All within three weeks! Seventeen-thousand miles! He spent a greater part of those three weeks resting and visiting than he spent traveling. I do not have to tell you how this was accomplished. Think it over. Think what this means and what it will mean. Think of it in connection with what our air lines have been and are doing to keep the United States abreast and in many ways ahead of the rest of the world in both our domestic and international air transportation. Our status in world aviation must be maintained if not increased and we have an extremely difficult job ahead of us to maintain our present relative status.

There is no field in which the planning of the future needs to be carried on more continuously than aviation. Conclusions based on present conditions should be reviewed at frequent intervals and be regarded as especially flexible and subject to change. This statement is made advisedly as applying to the technical or engineering phase of our business. I repeat, in conclusion, that a more definite governmental policy as regards the air-transport industry would be beneficial from the viewpoint of the public good.





# The Engineer in Transportation

BY JOSEPH B. EASTMAN

*Member, Interstate Commerce Commission*

**I** REGARD the invitation to address this dinner as one of the major honors which has come my way, because the Massachusetts Institute of Technology, as you probably know, is one of the world's great institutions of learning. It specializes in the production of engineers, and that fits in with the subject, transportation, on which I have been specializing in a way for some years. Engineers play a big part in transportation. Some might say that the locomotive engineer plays the biggest part of all, but the civil engineer, the mechanical engineer, the electrical engineer, the chemical engineer, and a few other varieties are all in the running too.

Sometimes I think that if we could make an assay of all of our professions and businesses, weighing in the scales creative ability, integrity, honor, accomplishment, and the like, the engineering profession would rank as high as any, and maybe higher. Experience with some engineers in rate-making valuation cases shakes me a little in this notion, having in mind the extraordinary differences in their testimony, dependent upon the side on which they happen to be. But perhaps they can be excused for these inconsistencies, because they are dealing in those cases with an entity or concept called "fair value," which was the product of legal rather than scientific minds, which has never been clearly defined by its creator, the Supreme Court, and which is certainly not susceptible of any very accurate measurement.

Passing over this somewhat drab page in engineering history, the other pages which relate to transportation are as bright as could be wished. The feats of engineering which made possible the construction, equipment, and operation of our 250,000 miles of railroads, over every imaginable kind of terrain, were spectacular and of the highest order. They placed the country everlastingly in debt to your profession. Yet I think that an even greater achievement has been the marvelous development in a very short space of time of highway transportation, including both the construction of the highways themselves and the creation and production of the automotive vehicles which use them. When I travel these days in the luxury of a modern airliner, I find it difficult to realize that not very far from this spot and not so very long ago I saw one of the early Wright planes take off from its catapult, make a short flight, and land on its skids, with the pilot perched on the edge of the lower wing.

Beyond any doubt, the scientists and the engineers will influence mightily the destinies of transportation. Astonishing as the progress has been, we may be sure that it will continue at an even faster rate. Here in Symphony Hall it is appropriate to suggest that the tempo is likely to accelerate from *allegro* to *presto*. Before we know it, we may find this earth of ours so small and all parts of it so easily accessible that the

thirst for exploration will have to find an outlet in other parts of the universe. The Buck Rogers of the comic strips may be the harbinger of a coming era.

Coming back to earth, it behooves every form of transportation to make the best possible use of the many opportunities which the engineering profession holds out to it. The highway and air transportation industries seem to be doing a reasonably good job along these lines, but I am not so sure of rail or water transportation. About two-and-a-half years ago I requested your President, as chairman of the Science Advisory Board, to appoint a committee to cooperate with a corresponding committee of railroad executives in an effort to ensure to the railroads the maximum benefits from the utilization of modern science and engineering. Dr. Compton promptly appointed a most distinguished committee, having among its members directors of scientific and engineering research carried on by some of the great industries of the country. The railroads chose as their committee six of their leading executives; Dr. Frank B. Jewett, '03, President of the Bell Telephone Laboratories, was made chairman of the joint body.

On October 9, 1934, after nearly a year's study of the subject, Dr. Compton was able to submit to me a report to which all of these men had unanimously subscribed. It reached the conclusion "that substantial profit will inure to the railroads and to their continued development as the nation's major transportation facility if a way can be found to permit of establishing and maintaining a research organization competent to deal with the major material problems of common interest." The report also discussed the way in which the new research organization should be initiated, the qualifications which should control the choice of a director, the form of organization which should be adopted, the manner of budgeting and technical control which would produce the best results, and various incidental advantages which might be expected to flow from the new organization.

Bear in mind that this report bore the names, among others, not only of such leaders in the research field as Jewett, Kettering, Bolton, Johnson, Frary, and your own Professor Jackson, but of such railroad leaders as Willard, Atterbury, and Donnelly. The advantages of such an organization as they proposed are quite clear: The railroad industry is not getting the benefits which it should get from mass production. Too much of its equipment is custom-made. In many of the materials and supplies which it uses there is far too great a diversity of types and sizes, a diversity which cannot be supported by scientific or engineering reason. The individual railroads go their several ways and dissipate the strength in research, testing, experimentation, and

development which would be conserved and fortified by an adequately equipped central organization, one which would serve alike all of the companies, big and little, and not only keep pace with, but anticipate the progress of modern science and engineering.

Properly managed, such a central agency would not strike down individuality or imprison enterprise in rigid standards; it would equip both individuality and enterprise with knowledge and means which would enable them to function far more effectively and bring to bear the concentrated power of united action to a common end.

Nearly two years have gone by since the distinguished committee set in motion by your President reached its unanimous conclusions, but very little progress has as yet been made in carrying these conclusions into effect. The delay is not difficult to understand, because there are those, both in and out of the railroad world, who fear that a central organization for scientific, engineering, and economic research would affect their personal interests adversely. The outcome will depend upon the extent to which the leaders in the railroad industry have the ability to see it as a whole, instead of as a mere aggregation of parts; have the perception to realize how much can be gained by pulling together, instead of in a variety of directions, where interests are identical; and have the strength of purpose necessary to overcome the inevitable opposition.

I have spoken of this proposed central research agency, because it is in a way the offspring, or at least the foster child, of M.I.T. It is merely an illustration of a general principle which is capable of sound, practical, and beneficial application to our railroads in many different ways. It is, in other words, only one of numerous paths to a single goal, and it is that goal which after all is the vital thing. Of course the ultimate end is railroad success, in the broadest and best sense of the word, but the way, and the only way, to reach that end is through better service at lower prices. That is a strong assertion, and it calls for explanation. As I see it, there are two main reasons, closely related yet different, why it is true.

The first of these reasons is a general one, and it applies to the entire field of industry. It greatly concerns you who are scientists or engineers, because it has much to do with whether your efforts will prove to be of service to mankind or of actual disservice. The methods and mechanisms which you create greatly magnify the ability of human beings to perform work. In one sense they are labor-saving methods and mechanisms. The question is whether these creations are to result in less or more employment — whether they are to deprive men of livelihood, or add richly to the opportunities for life, liberty, and the pursuit of happiness.

You will agree, I am sure, that there is no more important question before the world today, and I do not pretend to know the final answer to it. I do know that a way must be found to match the tremendously increased capacity for production with a capacity for consumption which is increased in equal or greater degree — putting it in different words — to convert mass production into production for the masses. Many men who have studied this problem believe, and I agree

with them, that the most satisfactory and the surest way of doing this is to see to it, if we can, that the economy and efficiency which the scientists and the engineers create are translated to the limit into terms of better and cheaper products which can be sold for prices which will bring them within range of a great popular consumption.

The great object lesson is what Henry Ford did with the automobile. Certainly the labor-saving methods and mechanisms which he and his associates created have not deprived men of livelihood but have added to the sum total of employment and human happiness. There have been other similar object lessons. To the extent, however, that there is an attempt to use the creations of the scientists and engineers, not as a means of producing and supplying better things at lower costs, but as a basis for speculative promotion or intricate, pyramided corporate structures or monopolies or other ways of diverting and absorbing exorbitant profits while prices are maintained, they will hurt rather than help mankind, and pave the way for the downfall of capitalistic society.

Even if the railroads were prosperous, which they are not, and had the transportation field to themselves, which they have not, I would still say that they ought in the general interest and in their own interest to strive continually for better service at lower rates.

This brings me to my second reason, which has particular reference to the railroad industry. That industry is faced by a necessity for better service at lower prices which is plainly evident regardless of any ideas as to general production and consumption which any one may hold. As you know, the railroads do not now dominate the transportation field to anything like the extent that once was true. They are beset by competitors on the water, on the highways, in the air, and underneath the ground. This competition has taken away a great part of their passenger traffic and important parts of their freight traffic. To a very considerable degree it is competition which cannot be bought off or driven out, because much of it springs from the power which shippers and travelers now have to furnish their own transportation without depending on carriers who operate for hire.

The facts show that this competition has already driven the railroads a considerable distance in the direction of better service and lower rates. The extent to which freight trains have been speeded up is indicated by the fact that we now find them with such names as the *Speed Witch* and the *Blue Streak*, and locomotives are being introduced which can be used interchangeably in freight and passenger service. You all know the progress which is being made with lightweight, air-conditioned, streamline passenger trains, hauled by new types of motive power. Since 1924, average ton-mile revenues have decreased about 11½% and average passenger-mile revenue about 35%. It is equally clear that the forces which have been impelling the railroads in the direction of better service and lower prices will not abate. There need be no fear that you scientists and engineers will go stale and cease your work in improving the other forms of transportation.

Mere slashing of rates to meet competition will not



do the trick. Many railroad men who were trained in the old school have the idea, I think, that by such slashes they can kill off their competitors, as they drove the boats off the rivers in the old days, while continuing to maintain a high level of rates at noncompetitive points and on noncompetitive traffic, or even to increase that level. They will find modern competition far too pervasive, in my judgment, for any such treatment. The sound thing to do is not to cut rates regardless of costs, but to bring down the level of costs and bid all along the line for mass volume of traffic, whether or not competitors are after it.

The extent to which the country will respond to low-cost, attractive, convenient transportation has been demonstrated by what the automobile has done. The best estimates are that it has increased the travel habit of the American people fivefold. Some of the railroads are seeking the protection of the Supreme Court, because a tyrannous Interstate Commerce Commission has forced upon them passenger fares at two cents a mile. I venture to guess that before they are through they will be glad that there was a tyrant to do this. The American people will respond in the same way to low-cost, convenient, and dependable transportation of property. Any one who doubts that has only to figure the extent to which the cost of transporting raw material, fuel, semiprocessed materials, and finished goods enters into the prices which we pay for goods.

So I say that beyond a doubt the hope for a thriving and growing railroad industry in the future, able to furnish increasing employment, lies in a persistent reduction of costs which will strengthen the roads so that they can go forward with the work of improving their service and lowering their rates. For the past three years I have been laboring on this problem in the temporary job of Federal coördinator of transportation. The position will cease to exist on June 16, unless it is extended by new legislation. While not disposed to underestimate my own importance, the thing of real importance is that the idea of coördination shall survive.

Let me explain what I mean by coördination as applied to the railroads. They furnish a joint and national transportation service, but do it through a large number of separate and independent companies which have certain common interests and also certain conflicting interests. It is a fact, proven and well known, that the existence of these separate companies, as they are now conducted, causes a great deal of waste in operation and unnecessary expense. If this waste could be eliminated, it would cut costs many millions of dollars and be of vital help in the process of rehabilitating the properties and equipping them for better service at lower prices.

There are, roughly, three ways of eliminating this waste, in whole or in part. One is to promote coöperation of the companies, so that their activities may be coördinated or unified, where their common interests may be served without any real sacrifice of their conflicting interests. The establishment of a central research agency is one case in point. Gradual consolidation of companies, as in the past, might attend this process of coördination, but it would be incidental. Another

way would be to promote or force the consolidation of the companies into a very few great systems. A third way would be consolidation into a single system under public or private ownership.

As the best practical solution under present conditions, I chose the first way, which I call coördination. The other ways would restrict or suppress railroad competition more than the country now desires and is willing to accept, and are open to other objections. Moreover, the numerous independent managements serve a useful purpose in intensive administration and response to local needs.

The Act which created the Federal coördinator of transportation was intended to accomplish coördination of railroads. It contained an obstacle, however, in provisions which protected the employees of May, 1933, against loss of employment or reduction of compensation. At first, these provisions were a bar to immediate economies. Latterly, their enforcement would have operated unevenly and unfairly, protecting many men but not others. This obstacle has now been removed by an agreement between the managements and the men, effective June 18, which will give men displaced by coördination or consolidation projects 60% of their previous compensation for a considerable period of time or until they can be given equivalent employment.

Taken at face value, this agreement was an epoch-making performance and a product of real industrial statesmanship. While dealing justly with the men, it gave the railroads an opportunity to realize a very considerable part of the economies immediately and the remainder gradually, but quite rapidly if business improves. It gave the men protection against temporary hardships which coördination might impose, a protection such as the employees of no other industry in this country enjoy, or even the employees of our Federal, state, and municipal governments.

It remains to be seen how the agreement will work out. The official railroad attitude is for coördination, in principle. Two years ago the Association of American Railroads was created to promote greater coöperation and collective effort by railroad managements. Yet the Association often finds it difficult to do effective work of this character, because of conflicting views and the concentration of the managements on the apparent and immediate interests of the individual roads. Some of the executives of the larger roads frankly favor large-scale consolidations and disfavor coördination. Most of them are strongly opposed to any Federal statute which would help them to bring coördination about.

The employees regard the agreement as a valuable "Hindenburg line," useful in case of retreat, but seem prepared to fight in the front-line trenches against any displacement of labor, temporary or otherwise. They profess to feel that any economies from coördination would not inure to their advantage but only provide more milk for Wall Street to absorb. Apparently they are not greatly concerned by the prospect of what the railroads may be able to do in the way of coördination without governmental help, and like the executives they do not look with favor on any Federal statute which would supply such help.

I suggest that the country cannot wisely leave the



decision of this matter to the executives and the railroad labor chiefs. Theirs are by no means the only interests at stake, and they may be too close to their own interests to see them in proper perspective. Unemployment has been so widespread and its effects so disastrous to the railroad employees in the past few years that they naturally rebel against suggestions which they feel look to further contraction of jobs. There is no more important thing than the good of labor, but unless I am wholly in error as to the transportation future, that good will not in the end be served by any course of action which stands in the way of the best possible service at the lowest possible rates consistent with fair wages and good working conditions. Any such action is, I fear, long-range suicide, and no one who is a real friend to railroad labor will encourage them in it.

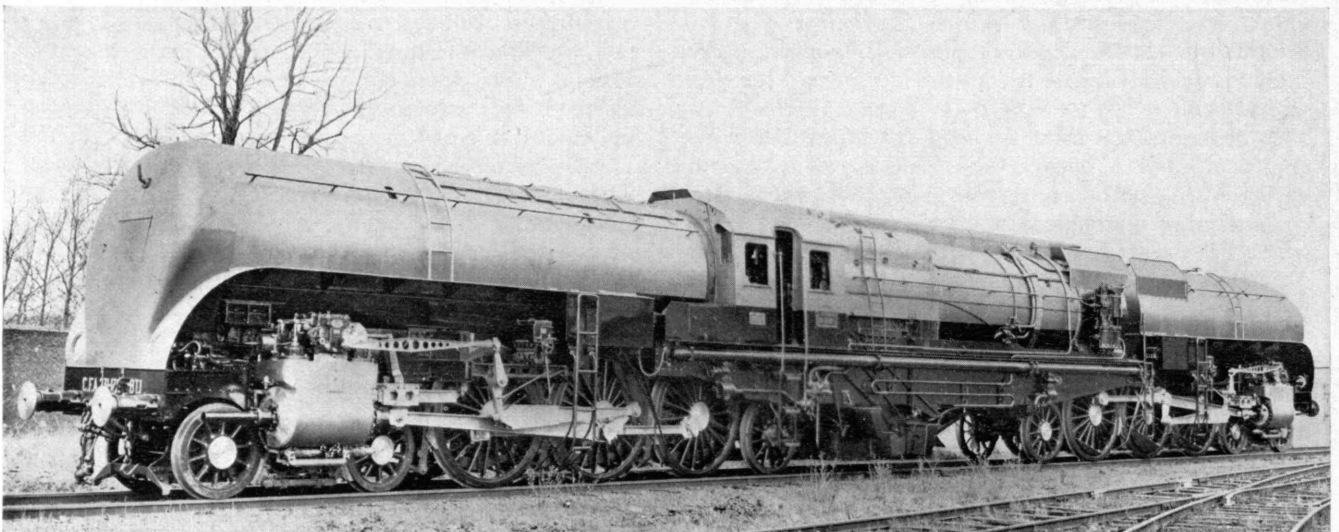
The railroad managements under present conditions are influenced by such a mixture of motives and emotions that I question whether they can be accepted as safe guides to a sound public policy.

What I have been talking to you about is coördination of railroads. The idea can and should be extended, of course, to embrace all forms of transportation. As a matter of fact one of the important means whereby the railroads will be able to improve their service and reduce their costs and prices will be the economic utilization, in connection with their rail operations, of both the bus and the truck. Each form of transportation is better fitted for certain operations and service than any other, and if we are to have the best national system of transportation, we must use all forms to the best advantage and at the same time discourage their use in uneconomic ways. Nor should you think that I regard coördination as the only means of improving the railroad situation. It is quite as important, for example, that the financial structures of the railroad companies should be re-

formed in many cases. With nearly one third of the total railroad mileage in bankruptcy or receivership, the way is open for such a reformation.

In a talk like this, I cannot come even near to covering all that ought to be covered. All that I can do is to touch upon a few salient points. The great trouble with the transportation problem is, I suppose, the same great trouble that is encountered in every other important problem. It becomes the battleground of special interests who are apt to drown out the voices of those who undertake to bring the general interest into the range of consideration. No one should or could prevent such special interests from expressing their views, but at least it can be recognized that there is a general public interest which ought also to be taken into account.

In the long run, and whatever may be done for the moment, I have a vast amount of confidence that the idea of coördination will prevail in one form or another, and in ways or by means which perhaps we do not now foresee. It will be forced upon transportation by the natural course of events, and the engineers and scientists will be important contributing factors. There is, I think, not the slightest doubt that they will continue each year, as they have in the past, to multiply the possibilities of transportation. The ground for concern lies, not with the process of multiplication, but with the process of division which must follow it. The vital thing is to see to it, if we can, that the dividends go where they will do the most good for all mankind, and that is where the forces of government should play their part. I congratulate you on what you have accomplished, I look forward to what you will accomplish in the future, and I hope with all my heart that the products of your creative minds will not be abused but used to serve and advance the lot of humanity in general, not only in transportation but in everything else.



*High-speed Beyer-Garratt locomotive built for the Algerian Railway*

*American Locomotive Co.*

# THE INSTITUTE GAZETTE

PREPARED IN COLLABORATION WITH THE TECHNOLOGY NEWS SERVICE

## " . . . In the Fellowship of Spring "

*Even the east wind blew benevolently on June 8, and the rhododendrons in the Great Court were still gay with blossoms, lending an obbligato of natural color to the class pennants and umbrella tables. Where once rolled a desert of gravel, Alumni strolled across the greensward and gathered in friendly groups under the benign shade of the trees. On the Basin's edge the Sailing Pavilion was as bright and proud with flags as the Queen Mary, and the dinghy fleet transformed the monochromatic river into an animated pattern of polka dots. . . .*

THUS with trope and metaphor might we describe the setting of Alumni Day. Nature smiled, and, as though in gracious response, this new type of reunion, begun only last year, seemed to have reached maturity. In the solidity and importance of its serious events and in the gaiety, warmth, and good fellowship of its lighter program, Alumni Day, 1936, seemed an adequate fulfillment of the hopes of those who have championed the plan. To last year's committee who laid the foundation under the direction of Hamilton L. Wood, '17, and to this year's committee who so happily brought the plan to fulfillment under the direction of Harold B. Richmond, '14, is due an accolade from all those who cherish the Technology spirit and who wish to see its vivifying influence extended throughout our alumni body.

Let the statistical facts of the day be recorded, although they are quite inadequate to suggest how successful the program was in terms of sociability, enthusiasm, and that morale, or "breath of life," about which President Compton spoke in his commencement address (see page 414).

In all, 750 people actually registered on Alumni Day, but there were many who did not, and 1,500 would be a reasonable estimate of the number who attended all or

part of the program. At the dinner in Symphony Hall there were 628 and in addition there were 622 seats in the balconies filled for the speaking program and concert, bringing the total attendance at Symphony Hall to 1,250. There were approximately 100 wives of Alumni present during the day.

One of the most pleasant of all of the events was the luncheon in Du Pont Court, and the class day exercises of the senior class, which followed this luncheon, were an effective addition to the Alumni Day program. These various outdoor events emphasized, perhaps for the first time, the superb setting which the Institute offers in its courts for gatherings of this sort.

Elsewhere in this issue we present the complete proceedings of the Transportation Conference in the morning, and the material attests to the importance and value of the conference. In spite of the Republican National Convention, the papers presented, together with Mr. Eastman's speech in the evening, received wide notice in the press. We hope very much that this idea of having as a part of the annual reunion program a serious and solid conference of this kind will be continued. The dedication of the boathouse and the sailing regatta in the Basin were an effective demonstration of the increased scope of extracurricular activities at Technology.

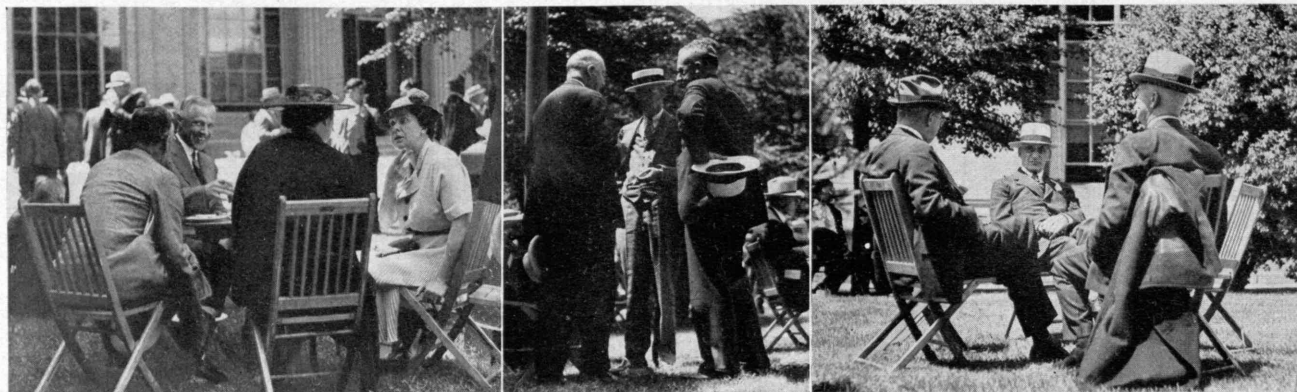
Certain changes in emphasis would, perhaps, be desirable in future Alumni Days, although the basic plan employed this year seemed eminently successful. All of the serious and heavy material should be concentrated in the morning conference and the evening dinner given over entirely to pure entertainment. It would seem desirable to have some event early in the morning to draw the Alumni together immediately and to act as a focal point for those who do not desire to attend the conference. The program for the women can, doubtless, be extended; certainly there should be a program for wives of



M. I. T. Photo

Scenes in the Great Court on Alumni Day when members of the Senior Class and their parents joined with Alumni in Class Day exercises. Included in the program was the christening of the dinghies by Miss Jean Compton, daughter of President Compton, and the welcoming of the seniors into the Alumni Association by Edward L. Moreland, '07, retiring President of the Association





M.I.T. Photo

Groups at the Alumni Day luncheon. Left. President Compton and Mrs. Compton (in white) at a table with Redfield Proctor, '02, and Mrs. Gertrude S. Hinckley, '10. Center. Edwin S. Webster, '88, Dean Vannevar Bush, '16, and Treasurer Horace S. Ford. Right. Gerard Swope, '95 (center) and Franklin A. Park, '95

the Alumni. The committee is studying the relative advantages of Saturday and Monday; there are desirable features attached to each of these days, but the controlling factor will be the class reunions. These reunions this year were notably well attended; 1911, 1916, and 1926 drew unprecedentedly large attendance.

That Alumni Day should be a permanent part of the assembly program is beyond question. In the words of President Compton, the program of June 8 "set a standard which it will be difficult to carry on, and there is no doubt but that the welfare of the Institute was markedly advanced by the success of this Alumni Day." We are confident that the committee in charge next year will consolidate the gains that were made this year and will add to the importance and usefulness of the reunion.

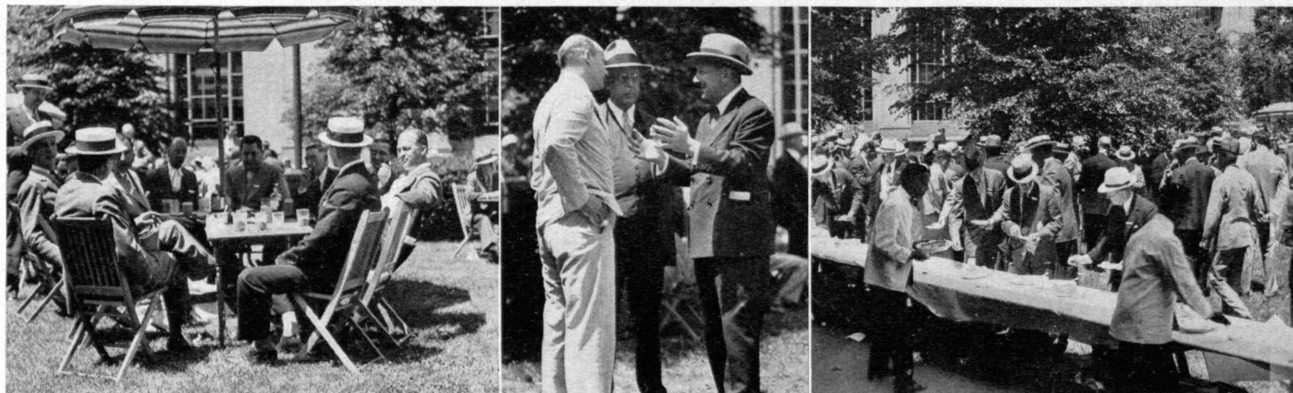
### Presentation of Dr. Tyler's Portrait

WE present on the next page a reproduction of the portrait of Harry W. Tyler, '84, painted by Isaac B. Hazelton, '94, and presented to the Institute on Alumni Day in the presence of a large group of Dr. Tyler's classmates, former colleagues, and friends. The presentation was made by Samuel C. Prescott, '94, Dean of Science, and Henry B. Phillips, Head of the Department of Mathematics, accepted the portrait.

Said Dean Prescott: "No occasion could be more fitting for the presentation to the Institute of a portrait of a distinguished Emeritus Professor who has rendered

long and conspicuous service to his Alma Mater than an Alumni Day, when he can share by his presence the numerous events, surrounded and attended by his former colleagues and receiving their warm congratulations, and heartily welcomed by some of the hundreds of his former students. It was their generous action, indeed, inspired by their high regard for their brilliant teacher, that has made this event possible and an important one in our day's program. Their prompt and spontaneous response to the suggestion that Dr. Tyler's portrait should adorn this room was ample evidence of the great respect and affection in which he is held by his former students.

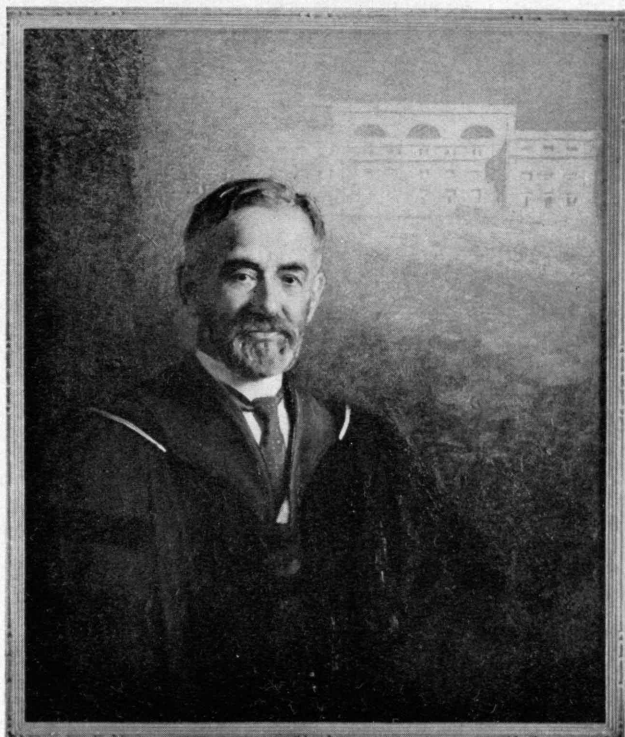
"It is unnecessary for me to tell any group of Technology men and women who Harry W. Tyler is. They all know that he was a member and leader in the Class of '84, a high-ranking student (and graduate of the Course) in chemistry, but who for pure pleasure and love of learning took all the advanced courses in mathematics given in the Institute in his day. Even with these scholastic labors he found time to indulge in the student activities of his day and to serve on the editorial staff of *The Tech*, which was started in 1881-1882, and in his senior year, 1883-1884, was president of the board of directors. He taught mathematics for three years following his graduation, then having happily induced his classmate and fellow chemist, Miss Alice Brown, to become Mrs. Tyler, they spent two years in travel and study abroad at Göttingen and Erlangen.



M.I.T. Photo

Other groups in Du Pont Court. Left. 1916 Table. Center. Jerome C. Hunsaker, '12, Paul W. Litchfield, '96, and Edward P. Farley





*This portrait of Harry W. Tyler, '84, painted by Isaac B. Hazelton, '94, was presented to the Institute on Alumni Day (see opposite page)*

"Those Alumni of my own student period know him as the secretary of the Institute, combining in one individual the trinity of offices known to more recent students as registrar, admissions office, and secretary of the Faculty, to which positions he was literally drafted by President Walker. Had deans been at that time extant, he would probably also have been dean. How well some of us may remember the brief note 'Please see me. H. W. T.' in his characteristic, small handwriting with which he summoned any student to his office, and the businesslike yet always courteous and kindly manner with which the matter in hand was considered.

"We older Alumni knew him at a time ten years later as the champion of the autonomy of the Institute, fearlessly and logically and successfully supporting the position of those who believed that in Technology's independence lay the road to success. We recall how in days of financial stress that followed he used his great organizing ability and constructive thinking as a tireless worker for its upbuilding and strengthening. Today he has but to look about him to see some of the fruits of that for which he labored, and I feel sure finds in the Technology of the present the reward for all the efforts extended in its behalf.

"As chairman of the Walker Memorial Committee, he guided the campaign which brought into existence the splendid student center which has served so admirably for a score of years, and with such constantly increasing use that its enlargement is now greatly needed. It was an especially happy thought of the artist that the memory of this service should be perpetuated in the suggestion of Walker Memorial painted in the background of the portrait.

"We knew him as the Head of the Department of Mathematics, brought under his wise guidance to a position of the very first rank in this country.

"We here at M.I.T. know him as the prime mover and perennial president of the Faculty Club for many years, a position in which his gifts as a presiding officer and the flashes of his scintillating humor carried us to new heights of admiration and regard. We know him as an intrepid mountaineer and lover of those vast natural scenes of beauty and grandeur which delight and inspire; as an ardent traveler, who finds enjoyment in surveying the manners and customs of other peoples; and as a student of educational problems. . . .

"With ever deepening appreciation, we who have long been at the Institute think of him as a conscientious and thorough teacher, with sincere and friendly interest in the student's welfare, as a virile, constructive force in the determination of faculty and Institute policies, and, best of all, as a steadfast and cherished companion and friend, and as a man of unsullied character.

"Perhaps my inadequate characterization may indicate why this portrait is before you. Obviously it is because of what he has done and because of our regard for the man who has all these qualities which so exemplify the traits we wish might be developed in every student that it gives the Committee the greatest pleasure to present to the Institute, to keep for all time, for the constant inspiration of student and staff members, this portrait of Harry Walter Tyler.

"We are proud that its artistry has been executed by a master who is also a Technology man and a former student of Dr. Tyler's. This means that the artist has mixed his pigments not merely with skill and with brains, as legend tells us one of the old masters claimed to do, but also with appreciation of character, respect, and affection. We are happy that Ike Hazelton, '94, is here today among the many who have come to honor their Alma Mater.

"At this moment one circumstance leaves its deep shadows of regret and disappointment in our hearts. It was originally intended that Professor Augustus H. Gill, '84, chairman of the Tyler Portrait Committee, should stand in my place today and make the presentation of this portrait to the Institute. No one else could do it so well as he. For the 56 years since Dr. Tyler and Dr. Gill entered the Institute as freshmen, they have been almost constantly associated in educational work either as students or teachers, and have been warm and devoted friends. It was, therefore, specially appropriate that Dr. Gill should have been spokesman today. Unfortunately his illness prevents him from enjoying this deserved honor and high privilege. His remarks would have been, I am sure, inspired with the admiration and regard that a half century of comradeship can well engender, and since they worked side by side through the four undergraduate years at the Institute, as well as in the whole period since those days, there might be more of personal allusion to the student days than I can offer. But may I, who have been both student and junior associate, speak as one who still retains all the deep respect and a trace of the awe of the student for his master, although for 30 years the awe has been largely replaced by increasing admiration for a great colleague. . . ."

## Graduation

**N**EWTON D. BAKER, Secretary of War in the cabinet of Woodrow Wilson, was the orator at the Commencement Exercises which marked the 75th anniversary year of the granting of the Institute's charter at Symphony Hall on the morning of June 9. He spoke without prepared manuscript or notes on the subject, "Science and Politics."

A total of 532 degrees, of which 380 were bachelors, were conferred by President Compton. Advanced degrees included 24 doctors of philosophy, 17 doctors of science, and 111 masters of science. This year, for the first time, the smaller illuminated diplomas, encased in red morocco binders, were given.

The academic procession of the guests of honor — the Corporation, members of the Class of 1886, the officers of the Class of 1911, and the Faculty — was again led by Chief Marshal Alexander Macomber, '07. He was followed by President Compton; Mr. Baker, escorted by Vice-President Bush, '16; the Reverend Dana McL. Greeley, minister of the Arlington Street Church, who gave the invocation and who was escorted by Professor Charles E. Fuller, '92, Chairman of the Faculty; General Fox Connor, Commanding General of the First Corps Area and of the First Army, escorted by Colonel Samuel C. Vestal; Captain E. R. Norton, '13, representing the United States Navy, escorted by Professor James R. Jack; and Mayor John D. Lynch of Cambridge, escorted by Professor Harry M. Goodwin, '90, Dean of the Graduate School.

Following the guests-of-honor division of the procession came four members of the Faculty who retire this year: Professors James L. Tryon, George B. Haven, '94, Thomas Smith, and Nathan R. George; and 29 members of the Corporation, marshaled by its Secretary, Walter Humphreys, '97.

Dr. Samuel C. Prescott, '94, was marshal of the Class of 1886, celebrating its 50th reunion, and those who marched in this division were: Charles F. Richardson, Dana P. Bartlett, Major Frank S. Wilson, Charles H. Woodbury, Robert Coit, Henry A. Howard, Charles H. Herrick, Henry B. Alden, and Dr. Alice G. Bryant — all of Boston — Louis F. Cutter, Henry P. Benson, and Ambrose Walker of Salem, Mass., Arthur T. Chase and George P. Aborn of Newton, Mass., William K. Campbell of Wollaston, Mass., Birney C. Batcheller of Wallingford, Vt., Arthur G. Robbins of Winchester, Mass., Fred A. Whitney of Leominster, Mass., Charles E. Holmes of Lynn, Mass., David Van Alstyne of Wilton, N. H., William F. Dawson of Holliston, Mass., Howard G. Noble of Westfield, Mass., D. Lewis K. Hathaway of Warren, Mass., James T. Ball of Still River, Mass., John W. Killinger of San Francisco, Calif., and Walter R. Ingalls, William H. Chadbourn, Fred E. Foss, and Theodore Stebbins — all of New York City.

The officers of the 25-year class, 1911, Donald R. Stevens of Passaic, N. J., and Orville B. Denison of Worcester, Mass., marched at the end of the 50-year class division. The faculty division, composed of 113 members of the Staff of various Institute departments, had as marshal Professor George E. Russell, '00. Lead-

ing the long procession of candidates for degrees were John C. Austin of Spokane, Wash., President of the Class of 1936, and the three class marshals — Brenton W. Lowe of Fitchburg, Mass., Fletcher P. Thornton, Jr., of Summit, N. J., and Anton E. Hittl of Melrose, Mass.

In his address to the graduating class President Compton said in part: "It was about 300 years ago that Francis Bacon wrote: 'That which man altereth not for the better, Time, the Great Innovator, altereth for the worse.' This is a universal truth, as true today as 300 years ago and as true of you men individually as it is of a business organization, or a farm, or a building. The only recipe for avoiding decay and stagnation is ever to press onward, endeavoring to alter yourselves and your circumstances for the better. . . ."

"'The breath of life' is a wonderful symbolism for that which makes the difference between the nonliving, or dead, and the living. It symbolizes all that is creative, lovable, and most precious in this world. The French have the phrase *esprit de corps*, i.e., breath (or spirit) of the body. We have the equivalent word morale.

"If I could select any virtue to endow you with at this time, it would be this 'breath of life' that we call morale. It includes courage, honesty, cheerfulness, persistence, coöperativeness, sportsmanship, and all those virtues which are the mark of success in one's own inner life and also in one's social relationships. When the Lord fashioned Adam, the body and all its organs were not enough to constitute the living man; the breath of life was needed. Though your parents, teachers, and associations have given you bodies and brains and a certain amount of skill in the use of both, you are not really desirable and productive units in society unless you also possess morale. Without it no one will like to have you around; no employer will desire to retain your services; you will be a failure in society and in yourself.

"Nations are strong and their people happy when their morale is high, even though troubles beset them. It is their morale which has been the secret of strength of religious sects. It was lack of morale, due to disinterest and distrust, and not lack of equipment or fundamental bravery, that led the Portuguese army to break before the German attack at a critical time in the Great War. A ball team, or a business organization, or a college is made or wrecked by morale. It is not success which creates morale but morale which creates success. A man with bad morale in an organization is like a pestilent infection and almost no amount of ability or even genius can compensate for it to make him a desirable member. . . ."

"So in conclusion, my friends, keep your morale high. Avoid as you would a deadly plague any tendency to let it slip. Maintain faith in yourselves even in face of discouraging circumstances. Be unselfishly coöperative, without being a 'yes' man. Make a positive effort to foster those personal and organizational contacts which will give you zest, enthusiasm, moral support, and professional growth. Keep in touch with the Institute through our Alumni Association, your Class, your Professors, and the placement office. You can do much to maintain your morale through conscious effort. My



parting word to you is, therefore: 'Keep up your morale; inhale deeply and continually of this magical breath of life.'"

### *New Members of the Corporation*

THE election of three new Life Members of the Corporation was announced by President Compton at the meeting of the Institute's governing body on June 8: Godfrey L. Cabot, '81, President of Godfrey L. Cabot, Inc., Boston; Philip Stockton, '99, President of the First National Bank of Boston; William C. Potter, '97, Chairman of the Board, Guaranty Trust Company, New York City.

In addition to his many business and industrial affiliations Mr. Cabot has long been interested in aeronautics. He was president of the Aero Club of New England from 1915 to 1929, and later became vice-president of the Aero Club of America. He is a trustee of Norwich University and president of the National Gas Products Association, the Wak Company, the Cabot Gas Company of New York, and the Service Gas Company of Pennsylvania. He is also treasurer of the New England Watch and Ward Society, vice-president of the Texas Elf Carbon Company, member of the executive committee of the United Carbon Company, and a director of the Carbon Black Export, Inc.

After being graduated from Technology, Mr. Stockton joined the Merrimac Chemical Company at Huntsville, Ala. He later was elected treasurer of the Lowell Bleachery, 1901; president of the City Trust Company, Boston, 1902; president of the Old Colony Trust Company, Boston, 1929; a director of the American Telephone and Telegraph Company, American Sugar Refining Company, General Electric Company, Ludlow Manufacturing Associates, New England Mutual Life Insurance Company, Pacific Mills, and others. He is also a trustee of the Boston Five Cents Savings Bank.

Mr. Potter was graduated as a mining engineer, a field in which he had wide experience before entering banking. He was general manager of the Guggenheim Exploration Company, Mexico City, 1902 to 1905; general manager of the Inter-Continental Rubber Company, 1911 to 1912; vice-president of the Guaranty Trust Company of New York, 1912 to 1916; partner, Guggenheim Brothers; vice-president of the Chili Copper Company, and president of the Braden Copper Company, 1916 to 1921. He is a member of the American Institute of Mining and Metallurgical Engineers and the Newcomen Society and a director of the Anaconda Copper Mining Company, Atchison, Topeka and Santa Fe Railway Company, Continental Baking Corporation, Continental Oil Company, Discount Corporation of New York, Electrical Bond and Share Company, and the International Agricultural Corporation.

### *Finance Committee Changes*

THE resignation of Francis R. Hart, '89, as chairman of the finance committee of the Corporation, a position he has occupied for twenty-six years, was announced last month. The growing responsibilities of his

business affairs and the belief that a younger man should take over his duties were given by Mr. Hart as the reasons for his resignation. His place on the committee will be filled by Philip Stockton, '99, President of the First National Bank of Boston and new Life Member of the Corporation, who brings to the committee long and valuable experience as a banker.

Mr. Hart, who is president of the United Fruit Company, has been a member of the Institute's Corporation since 1907, when he was elected treasurer, and he was elected a Life Member of the Corporation in 1909. Mr. Hart's first term as treasurer continued until that year, and in 1913 he was again elected treasurer, serving until 1921. He has been a member of the finance committee since 1910, and has given much time and thought to the affairs of Technology in the intervening quarter of a century. Although he now gives up his duties on the finance committee, Mr. Hart will retain his membership on the executive committee of the Corporation.

Mr. Hart was a member of the Class of 1889 at Technology and upon leaving the Institute he divided his time between work on the engineering staff of the Massachusetts Electrical Engineering Company and engineering work on the plantations of the Boston Fruit Company in Jamaica, West Indies. A few years later he became general manager of the Cartagena Terminal and Improvement Company, Ltd., and the Cartagena-Magdalena Railway Company in Colombia, South America. From 1893 to 1906 he was president of these companies and managing director of the Compania Fluvial de Cartagena, an associated organization. In 1896 Mr. Hart was elected a vice-president of the Old Colony Trust Company, later becoming vice-chairman of the board.

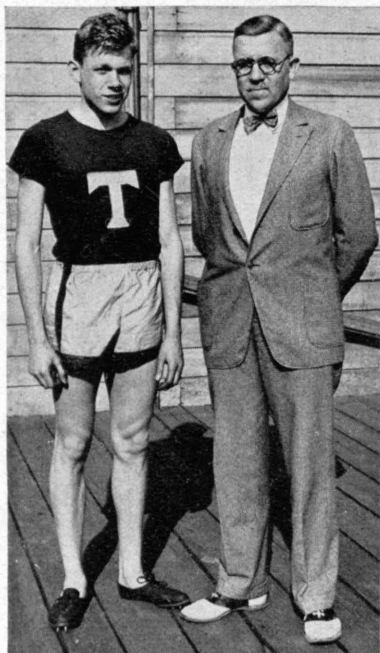
Aside from his numerous business interests, Mr. Hart is well known as an authority on the cultural and economic history of the Central American Countries and the Caribbean Sea, and is the author of three well-known books which grew out of his research in the history of the Caribbean. They are "Admirals of the Caribbean," "The Disaster of Darien," and "The Siege of Havana." He is also the author of many monographs and historical articles.

### *Piping Radio Waves*

A SIMPLE and efficient method of communication in which ultrahigh-frequency radio waves are transmitted through a hollow metal pipe in much the same manner as the human voice travels through a speaking tube has been developed in the communication laboratories of the Institute by Dr. Wilmer L. Barrow, '29.

This electromagnetic "pipe line" opens new prospects for the transmission of television, telephone, and telegraph signals at high efficiency. The commercial application of the system, however, must await the development of apparatus for the generation, amplification, and utilization of the extremely short radio waves, a vast and relatively unexplored field of communication. While radio broadcasting stations use waves hundreds of meters in length in a highly congested region of transmission channels, the hollow-tube method





Stanley T. Johnson, '36, Captain of the Track Team, with his father, "Doc" Johnson, a figure familiar to alumni followers of track. Johnson holds all the M.I.T. records in the broad jump

operates on waves only a few hundredths of a meter long. Theoretical expectations have been confirmed by successful laboratory experiments in which the voice was transmitted through a tube, picked up at the opposite end, and reproduced on a loud speaker.

In this method the radio waves travel within and on the infinitesimally thin "skin" of the inside wall of a hollow metal tube without interference from external signals or static. The simplicity, economy, and ruggedness of the system is indicated by the fact that, unlike

conventional wire and cable systems, this tubular conductor requires only external mechanical support, and the energy losses which usually occur in insulators are absent. This contrasts strikingly with the complex problem of insulation in the ordinary cable in which each individual wire must be carefully separated from its neighbor by paper or other forms of insulation. The rate at which the signals lose strength as they progress down the conducting tube is slightly greater than on conventional telephone cables. Calculations indicate, however, that signals transmitted through the tubes for long distances could be amplified at various stages.

Another feature of the system is that the end of the conducting tube may be flared to form an electromagnetic horn to send directive radio waves into the atmosphere in much the same manner as an acoustic horn produces a beam of sound. The hollow tube may also be used as a filter to cut out low-frequency signals.

Transmission of television signals from point to point or between cities offers a most promising field for this electromagnetic pipe line, provided apparatus capable of utilizing the very short waves can be developed for general commercial use. The unusual characteristics of the method are well adapted for transmitting the wide-frequency range demanded by television. The tube system of transmission also opens up stimulating prospects in other fields, including the possibilities of its use in direct broadcast or as a connecting link between the sending apparatus and antenna, or perhaps as the antenna itself in the form of an electromagnetic horn. Indications are that the hollow tube is better suited to the transmission of one centimeter waves than wires or cables.

The new system as it has been developed at Technology consists of the conductor tube, a transmitting terminal device, and either a receiving terminal unit or a radiating end, such as the electromagnetic horn already described. A short coaxial conductor, a wire at right angles to the axis of the tube, a parabolic reflector, and other arrangements of conductors may be used as terminal sending and receiving devices.

Dr. Barrow announced this important new development simultaneously with a similar announcement by the Bell Telephone Laboratories where the same method of communication was independently discovered.

### A Record of Records

COMMENCEMENT DAY, June 9, brought to a close the athletic career of Stanley T. Johnson, '36, as a wearer of the cardinal and gray of M.I.T. In his four years of intercollegiate competition, Johnson has scored the amazing total of 206 points — the largest number of points of any athlete ever to represent an Institute track team. His specialty was the broad jump, although in dual meets he has scored in both the high and low hurdles.

All of the Institute records in the broad jump for both the varsity and freshmen are now held by Johnson. As a freshman, his best effort was 22 feet, two-and-a-half inches. As a junior, he leaped 24 feet, two inches, establishing the varsity out-door record. His best records for indoor competition are 21 feet, three-and-a-half inches, and 23 feet, four and three-quarters inches, respectively, for freshman and varsity records.

In both the indoor and outdoor intercollegiate championships, Johnson has been a stellar performer, competing in his specialty. At both meets, for three years, he has won the broad jump once, placed second twice, and third, three times — a remarkable record of consistency.

In the summer of 1935, he won the broad jump in the Junior National Amateur Athletic Union Championships held in Nebraska, with the exceptional distance of 24 feet, 11½ inches — his best jump in competition. He will try for a place on the 1936 United States Olympic team in the running hop, step, and jump. Last summer he tied for second place in this event at the Amateur Athletic Union meet with a jump of 48 feet, six inches.

### Super Analyzer

A GRANT of \$85,000 from the Rockefeller Foundation will enable the Institute to begin construction of a new and more powerful analyzing machine called a differential analyzer. As projected by Dean Vannevar Bush, '16, the new analyzer will be built under the direction of Professor Samuel H. Caldwell, '25, and a group of associates in the Department of Electrical Engineering.

The present analyzer, which was built several years ago, has proved extremely valuable in various problems of analysis at the Institute, and has been constantly available for the solution of many complex engineering and scientific problems in widely diversified fields. Three similar machines, built with the aid of plans and advice made available by the Institute, are now in operation or under construc- (Continued on page 418)

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The Institute publishes a variety of bulletins, as well as a catalogue of general information essential to the entering student. The Technology Review Bureau will be glad to send, gratis and post free upon request, one or more copies of any publication listed below, or to forward any special inquiry to the proper authority.

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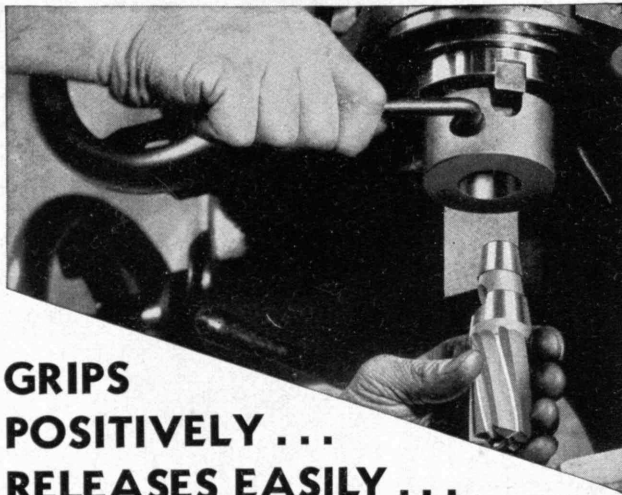
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## THE INSTITUTE GAZETTE

(Continued from page 416)

tion in this country and Europe. One is at the University of Manchester, England, another at the Astrophysical Institute of Oslo, Norway, while the third is at the University of Pennsylvania.

Improvements in design on which Dr. Bush and his group have been working during the present year under a preliminary grant from the Rockefeller Foundation promise even greater precision, flexibility, and scope.

### Prize Theses

**MISS PHYLLIS M. NEEDHAM**, '36, a graduate in Architectural Engineering, received the first prize offered by the Institute chapter of the Society of Sigma Xi, national honorary scientific society, for the best undergraduate thesis submitted toward the degree of bachelor of science. Her subject was "A Study of the Stratification Effect of Concrete." The second prize was awarded to **Dudley A. Williams**, '36, of the Department of Chemistry for a paper on "The Vapor Pressure of Nitrogen Dioxide," and third prize went to **Morris Sorkin**, '36, Electrical Engineering, who submitted a thesis on "Realization of a Band Pass Filter at Broadcast Frequencies." Honorable mention was made of **Edward L. Pratt**, '36, of the Department of Biology and Public Health, for a paper entitled "The Growth of Microorganisms on Media Exposed to Ultraviolet Radiations."

Miss Needham has been an active member of the Drama Shop during her undergraduate career. Mr. Williams was awarded his degree in December, 1935. Mr. Pratt was awarded his "T" for crew activities, and has been a member of the staff of *The Tech*, as well as Phi Beta Epsilon fraternity and Delta Omega, the honorary biological society.

### Stratton Prizes

**WINNERS** of the Stratton Prizes, which are awarded for the most effective preparation and presentation of scientific papers by members of the undergraduate professional societies, were: first, **Melvin W. First**, '36; second, **Edward C. Peterson**, '37; third, **Joseph Ackerman, Jr.**, '36.

The winning paper by First, who was graduated in Biology and Public Health, was "Control of Tuberculosis." Peterson, a junior in Mechanical Engineering, read a paper on "Cement Casting." Joseph Ackerman, Jr., who has been a student in the Chemistry Department, presented a paper on "The Direct Use of Latex in the Manufacturing of Rubber."

The judges were Dr. A. C. Dieffenbach of the Boston *Evening Transcript*, Mr. J. C. Hogg of Phillips Exeter Academy, and Colonel S. C. Vestal, Head of the Department of Military Science.

### Henry Adams Morss, '93 (1871-1936)

**I**N the midst of preparing statements concerning the death of his classmate, Albert F. Bemis, Henry A. Morss found it necessary to go to the hospital for an



operation from which he did not recover. His death occurred on May 6, not a full month after Mr. Bemis'. The Review shares with the Corporation of the Institute and with the alumni body the sorrow that is felt, and wishes to voice its tribute.

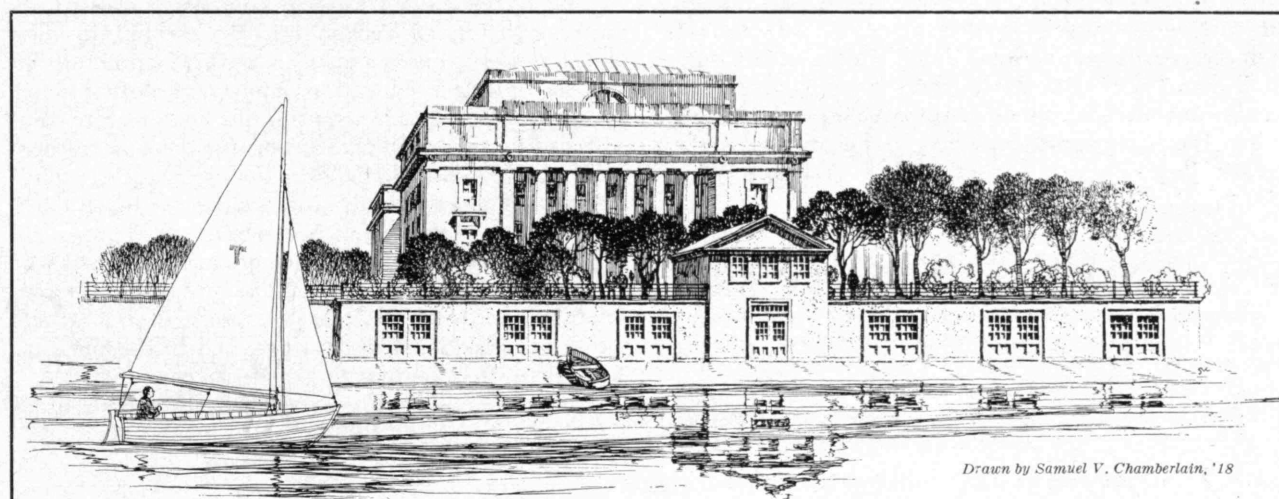
Mr. Morss's capabilities were diversified and his interests far reaching. To his Alma Mater he made valuable contributions, perhaps the most important as Corporation member and assistant treasurer. He began membership on the Corporation under term election in 1911, the first of his Class to fill this position, was re-elected in 1919, and in 1924 became a life member. He ably assisted his brother, the late Everett Morss, '85, Treasurer of the Institute for many years, in the financial administration of Technology, and was assistant treasurer for two terms between 1920 and 1934. In the latter year he became acting treasurer, a position he held until the election of Horace S. Ford as treasurer in the summer of 1934. Recently he served as an interim member of the Corporation executive committee.

As an undergraduate in the Department of Electrical Engineering Mr. Morss had been an active member of Theta Xi, and a member of K.O.S. and the Tech Electrical Club. It was perhaps natural, but none the less generous, that his graduate interests did not exclude Technology: In 1909 he was a member of a committee of three who investigated the advisability of initiating an aeronautical course at the Institute; he was president of the Alumni Association in the year (1918) when Walker Memorial, a project in which he was much interested,

was dedicated as the center of student activities; he served with notable success as a member of the Alumni Council. In 1923-24 he was a member of the Corporation's Visiting Committee to the Department of Military Science and Tactics, and in other years served on similar committees for Naval Architecture and Marine Engineering, Aeronautical Engineering, and the Nautical Museum, the progress and prestige of which were strongly influenced by his wise judgment and enthusiastic support. In 1930 he was a member of the inauguration committee which planned the dignified induction of President Compton, and he was, in 1935, a charter member of the Research Associates.

In the industrial field Mr. Morss started work in the factory of Morss and Whyte, and throughout his life he maintained his connections with that concern and with others which developed from it. In 1918 he became treasurer of the Simplex Wire and Cable Company, Simplex Wire and Cable Company of California, Simplex Electric Heating Company, and the Morss and Whyte Company. Later he was made president and director of the Simplex Wire and Cable Company of Cambridge, and was also trustee of the Morss Real Estate Trust, trustee of Radcliffe College, and a director of the Hub Wire Cloth and Wire Company and of Arthur D. Little, Inc.

Business and the Institute did not absorb all of his energies: He was a former president of the Boston Children's Friend Society; treasurer of the Old South Society; member of the American Institute of Electrical



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Engineers, American Society of Mechanical Engineers, and of the Union, University, and Exchange clubs of Boston. An enthusiastic yachtsman, he was a member of the Eastern, Corinthian, and New York Yacht clubs. At different times he owned some 20 boats and yachts of various sizes and types with which he took part in many races; these included two races to Bermuda which he won in his class. This delight in the wind and water found an unselfish outlet of benefit to the students at Technology: Mr. Morss, at the time of his death, was a member of the committee which superintended the building and launching of the fleet of dinghies whose fresh white sails on the Charles will be remembered by those who attended Alumni Day this spring.

### Arthur Amos Noyes, '86 (1866-1936)

**A**RTHUR AMOS NOYES, one of the most distinguished Alumni of the Institute, died on June 3 at his home in Pasadena, Calif., from the effects of pneumonia. He had returned only recently from the Mayo Clinic at Rochester, Minn., where he had undergone treatment for another ailment.

Born in Newburyport, Mass., on September 13, 1866, Noyes with his boyhood companion, Samuel Mulliken, developed a strong interest in chemical science. Together they experimented in all seriousness in their home laboratories, even working through such substantial volumes as Eliot and Storer's texts on chemistry and on qualitative analysis. In retrospect, it seems as if both Noyes and Mulliken were destined to pursue their higher education in the Institute of Technology, which, 60 years ago, as a new type of school for science and engineering was gaining fame daily. To this school they came about the year 1883, where organic chemistry became one of their main interests. At the end of their course they journeyed together to Leipzig to study further their chosen subject under Professor Wislicenus.

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Soon their paths of scientific pursuits began to deviate. Noyes became more and more interested in physical chemistry, the newly recognized discipline of the science. Ostwald, destined to become the great protagonist of this new kind of investigation, had been in charge of the work at Leipzig for a year, and in that short time he had attracted to his laboratory both the Swedish chemist, Arrhenius — with his electrolytic dissociation theory — and the Dutch chemist, Van't Hoff, famous for his theory of stereochemistry and for the discovery of the laws of chemical dynamics and osmotic pressure in solution. Among the associates of Noyes at that time were Nernst and Haber, both to be awarded the Nobel Laureate in later years.

After receiving the doctorate in 1890, Noyes returned to the Institute as an instructor in analytical and organic chemistry. In 1894 he was made an assistant professor, teaching mainly in the field of organic chemistry. It was not until 1899 that he became professor of theoretical chemistry and was launched definitely on the highway, leading, in 1903, to the establishment of the Research Laboratory of Physical Chemistry, the first research laboratory of the M.I.T. and the first, in the United States, to be devoted to physical chemistry.

Professor Noyes remained as director of this laboratory for 17 years. During this time there came to him many students, among whom were at least a score of men who in their turn were to rank among the most distinguished chemists in the United States.

In 1920, after long consideration, Professor Noyes withdrew from the Faculty of the M.I.T. to become director of the Gates Chemical Laboratory of the California Institute of Technology. He saw in this new school a great opportunity to put into practice his cherished ideals in education, namely, of early *selecting* the ablest students, of *interesting* the honors group thus obtained in discovery, and of *training* them in research while they were still undergraduates. In other words he was planning to build up in undergraduates a background of research experience which would make for abler and more deeply interested graduate students who at the end of their advanced training would be outstanding as investigators in industrial research laboratories, in educational institutions, and in the scientific bureaus of the government.

During the half century covered by the period of his active researches, Professor Noyes investigated prob-

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lems of reaction velocities, thermochemistry, chemical equilibria, qualitative analysis of the rare elements, and the development of the ionic theory. His chief efforts were centered on the nature of the solutions of electrolytes, a problem growing out of the work of Arrhenius and proving to be the most outstanding physical-chemical problem of the period. His interest in this field was life long. In 1924, the year after Debye and Hückel announced their theory of solutions which takes into account the electric forces between ions, Noyes published an exhaustive review and extension of the derivation of the new equations.

Noyes's best known books are "A Course of Instruction in Qualitative Chemical Analysis of Inorganic Substances," "A System of Qualitative Analysis for the Rare Elements" (with William C. Bray as joint author) and, with Miles S. Sherrill as co-author, "An Advanced Course of Instruction in Chemical Principles." This last-mentioned book, known familiarly by generations of students as "Chemical Principles" will be remembered by all who have used it, for its exacting problems which form an integral part of the text. It is this book which embodies thoroughly Professor Noyes's method of instruction whereby students learn of the principles of

science by using them in solving problems rather than just by hearing about them.

The more public services of Dr. Noyes brought him distinguished offices. He was president of the American Chemical Society in 1904, Acting President of the M.I.T. from 1907 to 1909, acting chairman of the National Research Council in 1918, and President of the A.A.A.S. in 1927.

Honorary degrees were conferred on Dr. Noyes by Clark University and by the Universities of Maine and Pittsburgh, each of which gave him an LL.D. Both Harvard and Yale made him an alumnus by granting him the Sc.D. In addition to membership in the American Chemical Society, the American Association for the Advancement of Science, the *Deutsche Chemische Gesellschaft*, and the *Bunsen Gesellschaft*, he was a fellow of the American Academy of Arts and Sciences, of the National Academy, and of the Philosophical Society, and a foreign associate of the Royal Society of Edinburgh. He was awarded the Willard Gibbs Medal of the Chicago Section of the American Chemical Society in 1915, the Davy Medal of the Royal Society of London in 1927, and the Richards Gold Medal of the Northeastern Section of the American Chemical Society in 1932.

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## MAIL RETURNS

(Concluded from page 370)

stanza one learns from science through a prominent scientist everything about "the skies." — Miss Dickinson, not being scientifically inspired, could only guess. One learns a star's composition, its relative motion, its age. In the same way one learns from science a man's composition, his structure. And having learned all this from science one may still ask, in the words of the Psalmist, "What is man that Thou art mindful of him?"<sup>1</sup> and in the words of the Lord to Job, "Canst thou bind the sweet influences of Pleiades, or loose the bands of Orion?"<sup>1</sup>

Science is knowledge, art is wisdom. "There is a knowledge of natural things. But wisdom is an excellent gift of God."

The skies can't keep their secret.

They tell it to man's heart

Through every sense: "I wisdom am,

The beauty that is art."<sup>2</sup>

*M.I.T., Cambridge.*

<sup>1</sup> These are poetry; art, not science.

<sup>2</sup> This is verse; art, not science.

### Retort

From PROFESSOR RALPH G. HUDSON, '07:

Professor Passano's comment on my article which appeared in the May Review contains too many misinterpretations and exaggerations to permit a detailed reply. In no place did I speak in generalization "of science as an inspiration of art." I did suggest that science "may be . . . a stimulus . . . to poetry." Sir Richard Gregory, editor of *Nature*, makes the same suggestion in a recent address on "The Interpretation of Science" and quotes Lucretius, Wordsworth, Milton, Dante, Goethe, Shelley, Tennyson, and many others in support of his contention. Kipling, in "M'Andrew's Hymn" says, "Lord, send a man like Robbie Burns to sing the Song o' Steam!" Hallows has published a small book called "The Poetry of Geology."

I deny the imputation that our graduates who contributed to the fine arts "may well have been . . . round pegs that succeeded in pulling themselves out of square holes." Most of these men first demonstrated considerable ability in the field of science and engineering. It would appear that Professor Passano has little conception of the nature of the new electrical musical instruments. It is an injustice to all scientists working in this field to suggest that these instruments bear any resemblance to a hand organ.

It is true that we derive many impressions of beauty through the sense of touch. My original manuscript contained a paragraph on that topic which was deleted for lack of space. It is nevertheless a fact that the marble statue which the "connoisseur will want to touch" will have been shaped for the most part with a pneumatic drill. My article offered no suggestion that such statues should be produced endlessly "like 'gas pipe' suitings."

No prophecy was made or implied that "these, and all schools of painting, are now to be discarded." The camera has shifted the objective of the artist. His attention has already been turned to the development of new types of composition and new forms and patterns which the camera will find it difficult to duplicate.

It is quite evident that Professor Passano does not share my enthusiasm for the inspirational value of science. When the scientists at Mount Wilson look through their telescopes they learn more than "a star's composition, its relative motion, its age." They see more wonder, more grandeur, and more mystery than most poets can imagine.

*M.I.T., Cambridge.*



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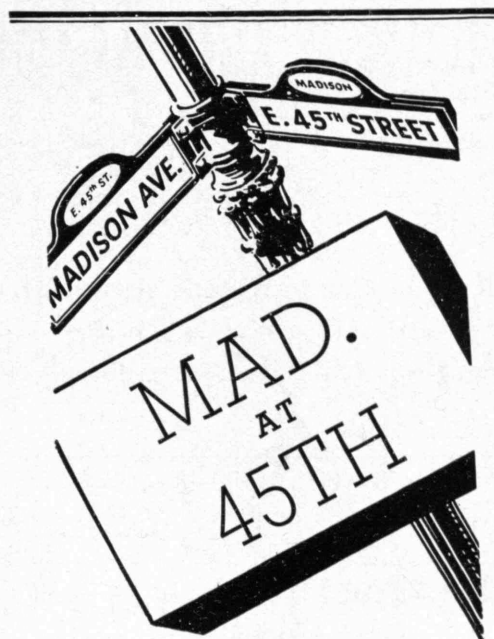
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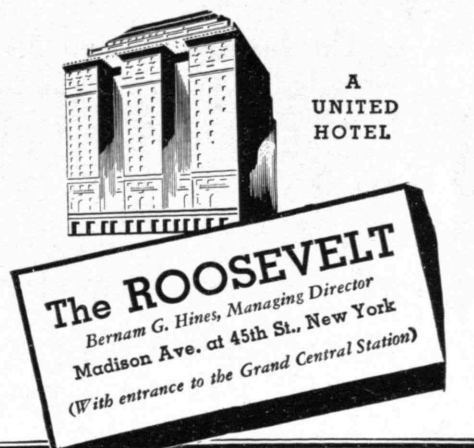
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## PLACEMENT STATUS OF 1936 GRADUATES

A recent employment survey of the Class of 1936 showed that a large percentage of those awarded degrees on June 9 are satisfactorily located for the coming year. The results of this survey are shown in the table below:

| EMPLOYMENT<br>STATUS<br>(as of June 1, 1936)    | <i>Recipients<br/>Doctor's<br/>Degree</i> |          | <i>Recipients<br/>Master's<br/>Degree</i> |          | <i>Recipients<br/>Bachelor's<br/>Degree</i> |          | ALL GROUPS |          |
|---|---|----------|---|----------|---|----------|------------|----------|
|   | Number                                    | Per cent | Number                                    | Per cent | Number                                      | Per cent | Number     | Per cent |
| 1936 GRADUATES                                  |   |          |   |          |   |          |            |          |
| Have accepted full time<br>employment . . . . . | 35  | 85       | 90  | 81       | 149   | 40       | 274        | 52       |
| Plan further study . . . . .                    | 0   | 0        | 3   | 3        | 47  | 12       | 50         | 9        |
| Report good prospects . . .                     | 2   | 5        | 8   | 7        | 80  | 21       | 90         | 17       |
| Without satisfactory<br>prospects . . . . .     | 4   | 10       | 10  | 9        | 100   | 27       | 114        | 22       |
| Totals . . . . .                                | 41  | 100      | 111                                       | 100      | 376   | 100      | 528        | 100      |

The positions accepted by this year's graduates have in most cases been more attractive than those available for several years.

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# TECHNOLOGY MEN IN ACTION

CHECK LIST OF THE ACTIVITIES AND ACHIEVEMENTS OF M.I.T. ALUMNI, OFFICERS, AND STUDENTS

## *We Note with Pleasure*

☛ That GEORGE A. CAMPBELL '91, who recently retired from the Bell Telephone Laboratories, has been awarded the 1936 Medal of Honor of the Institute of Radio Engineers.

☛ That LOUIS S. CATES '02 has been presented with the degree of doctor of engineering by Michigan College of Mines and Technology.

☛ That WILLIAM G. PERRY '07 has been advanced to fellowship in the American Institute of Architects.

☛ That MAYO D. HERSEY '09 has received the Louis Edward Levy Medal for his papers on "A Short Account of the Theory of Lubrication," in the June, July, August, and September issues of the *Journal* of the Franklin Institute for 1935.

☛ That JEROME C. HUNSAKER '12 has been appointed a member of the award committee for the Collier Trophy for 1935. This trophy will be given "for the greatest achievement in aviation in the United States, the value of which has been demonstrated by actual use during the preceding year."

☛ That MARSHALL C. BALFOUR '19 has been awarded the Silver Medal of the Greek Academy of Sciences, Arts, and Letters "in recognition of research in the field of malaria control in the Peloponnesus and in the Macedonian towns of Drama and Kavalla. Dr. Balfour is the representative in Greece of the international health department of the Rockefeller Foundation."

☛ That CHARLES A. CHAYNE '19 has been appointed chief engineer of the Buick Motor Company.

☛ That S. PAUL JOHNSTON '21 has been appointed editor of *Aviation*, a McGraw-Hill publication.

☛ That JOHN G. KIRKWOOD '29 won the Langmuir Prize of the American Chemical Society "for his work in solving long-standing and baffling problems in molecular chemistry."

☛ That JAMES B. FISK '31 has been chosen as one of seven additional scholars to belong to the Society of Fellows at Harvard University where he will have freedom in following his research in quantum mechanics and the theory of atomic nuclei.

☛ That WILLIAM C. GUSSOW '36, who has been a graduate student at the Institute this past year, has been

awarded a research fellowship in geology by the fellowship board of the Royal Society of Canada.

☛ That ROBERT J. VAN DE GRAAFF, Staff, has received the Elliott Cresson Medal for development of an electrostatic generator which has extended nuclear investigation.

## *In the News*

☛ WILLIAM E. LELAND '91, for appointment to one of four key technical posts for the San Francisco Exposition of 1939.

☛ GERARD SWOPE '95, for delivering the Steinmetz Memorial lecture in Schenectady, N. Y., on April 20.

☛ BRADLEY STOUGHTON '96, head of the department of metallurgy at Lehigh, on becoming Lehigh's first dean of engineering through action of the board of trustees.

☛ ALLEN B. McDANIEL '01, for his appointment to the Washington staff of the National Resources Committee as consultant on the special flood study which is being made this summer in preparation for a report to the 75th Congress. MERTON L. EMERSON '04 is assistant director of this survey and HAROLD K. BARROWS, Staff, was named by Secretary Ickes to make an exhaustive survey of New England and New York watersheds.

☛ VANNEVER BUSH '16, for election as chairman of the division of engineering and industrial research of the National Research Council. Among others on the executive committee with Dr. Bush are FRANK B. JEWETT '03 and JEROME C. HUNSAKER '12. MAURICE HOLLAND '16 is director of the division.

☛ THORNDIKE SAVILLE '17, on becoming dean of the college of engineering at New York University. In making the appointment Chancellor Chase said: "The appointment of Professor Saville as dean of one of the oldest university schools of engineering in the country is distinctly a case of the right man for the right job. A man of action and vision, he brings to the position exceptional training and a background of invaluable experience as a practicing engineer. . . ."

☛ DAVID L. FISKE '20, for attending the Seventh International Congress of Refrigeration, held in Holland in

June, as the representative of the American Society of Refrigerating Engineers.

☛ DAVID O. WOODBURY '21, for summer courses in playwriting and dramatic construction which he will give at Ogunquit, Maine, in two sessions of four weeks each.

☛ JOHN D. FITCH '24, for election as secretary-treasurer of the District of Columbia Council of Engineering and Architectural Societies, of which ALLEN B. McDANIEL '01 is chairman.

☛ DENTON MASSEY '24, one of the youngest members of the Canadian Parliament, for a speech, "Canada on Parade," delivered before the Canadian Club of Boston on May 26. Dr. KARL T. COMPTON introduced Mr. Massey, and among the guests were KENNETH C. REYNOLDS '25 and WALLACE M. ROSS, Staff.

☛ DONALD F. HORTON '27, for the capable way in which he took charge in Concord, N. H., during the flood and superintended work which saved the Sewall's Falls plant of the Concord Electric Company.

☛ CHARLES W. SUTHERLAND '31, for able handling of his plane in several difficult situations and for preventing the suicide of an hysterical passenger.

☛ EDWARD C. PETERSON '33, for appointment as city manager of Eastport, Maine.

☛ ROBLEY D. EVANS, Staff, for work in conjunction with Dr. Aub of Harvard in devising a way of eliminating radium poisoning from the body.

## *Off the Press*

☛ By ROBERT HALLOWELL RICHARDS '68, Technology's oldest living graduate, an autobiography telling of his years at M.I.T. This book will be off the press of Little, Brown and Company, the latter part of September.

☛ By SAMUEL C. PRESCOTT '94, Dean, as one of three editors, a new magazine, *Food Research*. This made its official bow in March and since then a second number has appeared. Its pages are devoted to results of original investigations of interest to those engaged in the food product industries.

☛ By RAY J. BARBER '06, an article describing the power plant and hydraulic installation which he designed for handling the gold placer

deposit at Scott Bar, Calif., *Engineering and Mining Journal*, Volume 137, April, 1936.

¶ By JAMES A. TOBEY '15, an informative discussion of "The Menace of Trench Mouth," a disease inherited from the War, *Good Housekeeping*, May, 1936.

¶ By ARTHUR L. GUPTILL '16, a magnificent volume, "Color in Sketching and Rendering," devoted to a consideration of the practical uses of color in pigment form and containing any number of beautiful illustrations, many of them in color. The publisher is the Reinhold Publishing Corporation, 330 West 42d Street, New York City.

¶ By SAMUEL V. CHAMBERLAIN '18, a book, entitled "A Small House in the Sun," reflecting the current interest in small colonial houses.

¶ By ALEXANDER A. NIKITIN '20, in conjunction with J. F. Adams, a report of research with a new copper fungicide, reprinted from *Transactions of Peninsula Horticultural Society*, Bridgeville, Del., Volume 25, Number 5.

¶ By RICHARD H. FRAZIER '23, a complete discussion of the prevailing system of comprehensive examinations for honors group students in electrical engineering at M.I.T., reprinted from *Journal of Engineering Education*, Volume 26, Number 7, March, 1936.

¶ By GLENNON GILBOY '25, an article entitled "Improved Soil Testing Methods," which briefly describes new instruments for consolidation, shear, and permeability tests, *Engineering News-Record*, May 21, 1936.

¶ By F. ROLF MORRAL '32, two contributions to *Metals and Alloys*, both dealing with the metallurgical industry in Spain. The first appeared in August, 1935, and was written by Mr. Morral in conjunction with D. Jose Serrat y Bonastre, entitled "Status of the Ferrous Metallurgical Industry in Spain." The second article was in the November, 1935, issue, entitled "The Non-Ferrous Mining and Metallurgical Industry in Spain." Dr. E. Jimeno coöperated in writing it.

¶ By FREDERICK G. KEYES, Staff, a tribute and résumé of the scientific contributions of CHARLES A. KRAUS '08, delivered on the occasion of the presentation to Professor Kraus of the Theodore William Richards Medal, printed in *The Nucleus*, May, 1936.

¶ By WYMAN P. FISKE, Staff, two published articles which appeared in May: "Financial Pitfalls Ahead,"

*Boston Banker*, and "Case Study of Cost Plan for a Small Confectionery Plant," *Bulletin* of the National Association of Cost Accountants. This latter was the joint work of Mr. Fiske and Clinton W. Bennett.

### The Lalor Foundation

¶ "The encouragement of outstanding young men to continue work in purely scientific research after they have completed their graduate training is a desirable object, which at the present time is receiving quite inadequate support. The Lalor Foundation expects, for the present, to dedicate its efforts to this service."

Awards for this coming year will comprise five professorship and fellowship grants. C. LALOR BURDICK '13 is secretary of this foundation which was made possible by the generosity of his uncle, the late Willard A. Lalor. Among others on the advisory board to the trustees are: ARTHUR B. LAMB '02, KATHARINE BLUNT '03, and CHARLES A. KRAUS '08.

## DEATHS

\* See class notes for account.

¶ CHARLES A. HECKSCHER '68, March 16.

¶ SAMUEL D. BUSH '73, May 10.

¶ JOHN C. CHASE '74, April 15. One of the Institute's oldest and most distinguished Alumni, Mr. Chase, at the time of his death, was president of the New England Historic Genealogical Society, of Pinkerton Academy in Derry, N. H., and of the Benjamin Chase Company, also of Derry. "His life presented the success-pattern that is almost a tradition in New England, passing from boyhood on a New Hampshire farm through teaching in district schools and study at M.I.T., to engineering in New England, New York, and North Carolina, ultimately retiring from that profession to return to Derry, where he was active in carrying on an old family manufacturing plant, presiding over Pinkerton Academy, and interesting himself in genealogical research." (*Boston Globe*, April 16.)

¶ SAMUEL L. ABBOT '75, April 5.

¶ ALBERT H. LOW '76, April 9.

¶ GEORGE BARTOL '77, April 3.\*

¶ JOHN W. CABOT '79, May 2.

¶ GEORGE CROCKER '79, April 25.

¶ CLARENCE L. KIMBALL '86, February 15.

¶ ARTHUR A. NOYES '86, June 3. Acting President of M.I.T. from 1907 to 1909 and a world-famous chemist, his death occurred in Pasadena, Calif. There he had been residing since 1919 when he became connected with the California Institute of Technology where he was director of the Gates chemical laboratory.

¶ WILLIAM A. C. ROGERS '86, February 15.

¶ STEPHEN E. COOMBS '87, May 22.

¶ SIMEON B. EISENDRATH '90, November 27.

¶ FREDERIC N. SIMONDS '91, April 12.

¶ FARLEY G. CLARK '93, May 31.

¶ CHARLES N. COOK '93, May 19.\*

¶ HENRY A. MORSS '93, May 6.\*

¶ CHARLES GILPIN '94, April 5.\*

¶ BENJAMIN SHEPARD '96, May 11.\*

¶ JOSEPH BANCROFT '97, May 6.

¶ HERBERT W. ESTABROOK '97, April 28.

¶ C. HOWARD WALKER '99, April 12. Three years ago, Mr. Walker retired as a member of the Institute's Architecture Faculty, thus rounding out nearly a half century of teaching, which included lectures at Harvard, the Boston Museum of Fine Arts, Lowell Institute, the Child-Walker School of Fine Arts (of which he was one of the founders) and the New England Conservatory of Music. His fame as an authority on architecture and the fine arts was international and for more than 50 years he was engaged in the practice of architecture in Boston. An honorary degree of doctor of fine arts was conferred on him in 1921 by the University of Pennsylvania. Another outstanding honor which he later received was that of being named one of six United States delegates to the International Congress of Architects held in 1930 in Budapest.

¶ HOWARD R. DUNBAR '00, May 15.\*

¶ DAVID LOW '01, date not known.\*

¶ GEORGE C. LENTH '03, May 12.

¶ HOLLIS H. SHAW '04, April 6.

¶ WILLIAM WHITE '06, April 14.

¶ WILLIS RANNEY '07, July 11, 1935.

¶ JOHN H. CATON '3d, '08, May 2.

¶ PERCY D. AMES '19, April 23.

¶ FRANCIS A. RICHARDSON '21, May 18.

¶ FINN BORCHGREVINK '22, March 27.

¶ ROBERT W. OLSSON '22, April 8.

¶ ELTWEEDE POMEROY '23, April 4.

¶ STILSON RYDER '26, April 12.

¶ H. GARDNER PRATT '28, May 17.\*



# NEWS FROM THE CLUBS AND CLASSES

## CLUB NOTES

### *Technology Club of Bridgeport*

The Club held its last meeting on May 8 at the University Club, with Leslie A. Hoffman '17, dean of the Bridgeport Engineering Institute and former WPA administrator for Rhode Island and Connecticut, speaking on "Modern Trend of Education." The M.I.T. song sheets which had been sent on from headquarters certainly served to put the old Tech spirit into the meeting. — JOHN E. KEARNS '32, *Secretary*, 161 Bronx Avenue, Bridgeport, Conn.

### *M.I.T. Association of Buffalo*

On April 13 the Association held a dinner meeting at the University Club of Buffalo. The graduates of the courses in chemistry and chemical engineering were well represented at the meeting as we had W. K. Lewis '05, the widely known professor of chemical engineering at the Institute, as our speaker. Dr. Lewis told of the methods that the Institute is adopting to admit students under a more flexible system and how the Institute hopes to stabilize its enrollment. He spoke of the many things that have been done to make the life of the students more enjoyable socially, such as the Graduate House, the 5:15 Club, and other similar activities. In discussing the recently established five-year course in engineering and social science, Dr. Lewis stated that the progress in this field was bound to be slow, but that the solution of its problems would probably come from men who had had a rigorous scientific training as a foundation. His discussion of the relation between the problems of the social scientist and the colloidal chemist was the best explanation we have had of this much disputed subject. At the conclusion of his speech he answered many questions that the members asked concerning the activities of the Institute. Dr. Lewis regretted bidding us good-by in order to catch an early train for Boston so that he could give the students their usual mental gymnastics.

John T. Walsh '15, gave a short talk on various phases of law and explained how people who are quite evidently guilty may be proclaimed innocent by the jury system.

Those attending were: G. E. Barker '30, C. J. Bernhardt '28, M. C. Brock '17, H. G. Brockington '25, J. G. Brunner '34, J. H. Burke '34, C. C. Coakley '17, T. J. Coleman '34, W. Ferguson '22, W. P. Foote '34, J. M. Gaines, Jr., '26, K. M. Gold '29, M. Gorham '93, R. L. Hershey '23, D. N. Higgins, Jr., '33, A. T. Hinckley '08, E. F. Izard '29, A. Kuhns '17, C. H. Mohr '33, R. P. Parker '32, M. M.

Perkins '31, J. W. Perry '31, R. E. Pfohl '17, C. N. Richardson '16, H. L. Smith '18, G. P. Standley '27, H. R. Terwilliger '33, and J. T. Walsh '15. — CALVIN H. MOHR '33, *Secretary*, 1224 Cayuga Drive, Niagara Falls, N. Y.

### *M.I.T. Association of Cleveland*

About 40 of those Alumni living in or near Cleveland met for dinner at Harvey's Coffee Shop at 6:30 P.M., Thursday, April 16. After a steak dinner with the usual trimmings, we settled down to the business of the evening. The first speaker was C. M. Barber, consulting engineer for the Great Lakes Exposition, which is to be held for 100 days in Cleveland this summer. Mr. Barber gave us a very interesting talk, illustrated with colored renderings, on the constructional features of the main buildings and the general layout of the exposition.

President W. L. Enfield '10 next introduced Registrar J. C. MacKinnon who gave us a very interesting and instructive talk on the affairs of the Institute and the plans for future enrollment. After Mr. MacKinnon had answered all questions put to him, our surprise guest was introduced: Professor Schell '12 happened to be in Cleveland for a business-management meeting and attended our local dinner meeting. He gave us an informal talk on the new sailing activity at the Institute. Since we had all heard rumors of the Technology Yacht Club this was an extremely welcome addition to our meeting. Everyone agreed that we were very fortunate to have three such interesting and well-informed speakers. — DURYEA E. ELMENDORF '26, *Secretary*, General Electric Company, 1133 East 152d Street, Cleveland, Ohio.

### *Dayton Technology Association*

The final meeting of the Dayton Alumni for the spring was held at the Engineers Club on May 8. Dr. Compton was the guest of the 73 Alumni and their wives at dinner and later in the evening he addressed the Alumni and members of the Engineers Club on "Investment in Education — A Way to Increase Its Dividends."

Dr. Compton's visit to Dayton was undoubtedly a strain on him: He was greeted as he stepped off the train at 7:30 in the morning by newspapermen and photographers and was interviewed for the Dayton papers; after a short rest period he was whisked out to the laboratories of Orville Wright to spend a few hours with the survivor of those two famous inventors of the airplane; at noon he was tendered a luncheon by E. B. Newill, chief engineer of Frigidaire Corporation, at which members of the engineering and plant staffs of the several

General Motors subsidiaries in Dayton were present; the afternoon was spent at Wright Field, the engineering division of the Air Corps, where Dr. Compton was greeted by General Robbins, in command; following dinner at the Engineers Club with the Alumni and an address later to the Alumni and members of the Engineers Club, he spoke over radio station WHIO on the general problems of educational institutes and their plans for meeting changing conditions. On Saturday morning, previous to his departure, Dr. Compton spent several hours with the staff of Antioch College at Yellow Springs, Ohio.

During the business meeting of our Association, the new officers for 1936 to 1937 were chosen: President, E. J. Barney '16; Secretary-Treasurer, L. N. Stanley '32. — No further meetings will be held during the summer months. The usual noon luncheons at the Engineers Club on the second Saturday of each month will be resumed in October. — ROBERT E. ROBILLARD '20, *Secretary*, Frigidaire Division, General Motors Corporation, Dayton, Ohio.

### *Detroit Technology Association*

The Association feels very proud in being able to report a most successful winter season. Our officers and committeemen have demonstrated boundless enthusiasm with the result that we have had unusually interesting monthly meetings attended by exceptionally large numbers of local Alumni. We are continuing the listing of our Club in Detroit's telephone book because newcomers and visitors are taking advantage of this facility to locate old friends.

In February we decided to publish a directory of Alumni residing in Michigan, northwestern Ohio, and northeastern Indiana. This area has about 435 Alumni. We have been continuously at work since, getting in information cards from these Alumni until now we have only 20 left who are either too disinterested to answer or for some reason have not received our cards and letters. We are financing this booklet by advertising. It has been a big job, but the officers interested in this endeavor feel well repaid in believing that this booklet will be particularly useful to newcomers to our area, especially younger Alumni. We plan to present each newcomer to our midst with a directory as a welcoming gesture. We also believe that each of the 435 Alumni who receives his copy during the summer will derive some profit from it. We plan to list the names alphabetically and also to have cross references by classes, courses, and towns of residence.

Before the historic days of 1929 the Alumni of Detroit had for some years sponsored a freshman scholarship, select-

ing a local boy to be the recipient. Last year an attempt was made to revive this very worth-while custom, but it was too soon; our members were not ready yet. This year, however, our scholarship committee is meeting with much better success and they are very hopeful of and are now working hard for ultimate success. This money is raised by mail and personal solicitations.

The officers for the winter season just finished were: Edward A. Ash '22, President; Robert C. Doremus '14, Vice-President; Franklin Fricker '25, 2d Vice-President (also chairman of program committee); John E. Longyear '26, Secretary; John D. Rumsey '33, Treasurer; Philip C. Baker '16, Honorary Secretary (also scholarship committeeman); Minor S. Dennett '11, Scholarship Committeeman; Robert S. Gans '13, Program Committeeman.

We have had eight regular monthly meetings during the winter season and one special meeting. Attendance has varied from 30 to 97, with an average of 55 per meeting for the nine meetings. Much of the credit for the tremendous success of these meetings should go to our program committee, who have given of their talents and time unstintingly. They and our other officers have worked tirelessly to the end that we have enjoyed what probably is the most successful season in the history of the local Club not only from the standpoint of the excellent average attendance, but also from the standpoint of the variety and exceedingly attractive programs. A brief chronicle of our meetings follows: October 16 — This, our first meeting of the season, announced to the 50-odd Tech men attending that the new life taken on during the past year was not only being continued, but also heightened. Everyone seemed to feel that our program committee was putting and would continue to put forth every effort to give us all something worth remembering. Subsequent events proved these feelings to be actualities. Through the hospitality of the Stroh Brewery Company this first meeting was held in the Stroh Brew House. Dinner was preceded by an inspection trip through the plant and was followed by a talk on "The History of Beer and the Brewing Process," delivered by Herman A. Rosenbusch, the Stroh brewmaster, who is also president of the National Association of Brew Masters and a recognized authority in his field. No small feature of this evening was the beer, given with the compliments of the Brewery. It was a very enjoyable evening.

November 19 — About 36 Tech men gathered at the Intercollegiate Alumni Club to have an authoritative exposition of what the public expects and wants in a motor car and how this public feeling has affected the development of the automobile. H. G. Weaver, who heads the customers research staff of the General Motors Corporation, talked to us on "Discovering What the Public Wants in an Automobile." Mr. Weaver, who pioneered this work for General Motors, is not only an authority on his subject, but

is also a very able after-dinner speaker. It was a most instructive and enlightening talk.

December 10 — Our December meeting was a real treat. The largest gathering of the year, 97, enjoyed it. We were entertained by the Chrysler Corporation. Through the hospitality of B. Edwin Hutchinson '09, Vice-President of Chrysler, this meeting was held at the Plymouth plant. We assembled in the lobby of the office building at the plant and at 6:30 P.M. moved into the private dining room where we enjoyed a most seasonal dinner of delicious roast turkey and other Christmas foods. This dinner was served with the compliments of the Chrysler Corporation. After dinner we were privileged in being conducted by experienced guides through the Plymouth plant. There was a guide for each group of about five. We also had the pleasure of hearing a short talk by H. G. Moock, Vice-President and General Sales Manager, and of viewing a movie which included the topics of safety, spectacular auto tests — such as driving cars through walls of flame — and glimpses of Chrysler personalities in unconventional fashion. It was an unforgettable evening.

January 14 — Thirty-six men arrived at the Intercollegiate Club for our January meeting. "Street Traffic" was the topic of the evening. Professor Miller McClintoch of Harvard University was our speaker. He is the director of the bureau for street traffic research. His subject, especially here in the Auto City, was very attractive. We were fortunate in having an authority talk to us on this up-to-the-minute subject. It was a very instructive evening.

February 11 — Almost 50 Technology men enjoyed the February treat. A. C. Litchfield '18 of the United States Rubber Company kindly arranged for our pleasure a special dinner, an instructive talk, and an inspection trip of the tire factory. After a very delicious dinner in the United States Rubber's main Detroit building, M. A. Clark, the company's personnel and industrial relations manager, talked to us on "The Human Side in Industry." Then we were divided into small groups and were conducted by guides through the continually operating tire and certain rubber products plants. A feature of the evening was viewing the new United States nonskid tire in its experimental stages. It has since been announced to the country through advertising. It was an educational evening.

March 4 — Our March meeting was our annual meeting and 75 men from Michigan and Windsor, Canada, gathered at the University Club in Detroit for a very pleasurable evening of drink, song, food, talks, and good-fellowship. After some 300 Martini cocktails had performed their part of the festivities, we enjoyed the singing of various Tech songs and sat down to a good old University Club dinner. After dinner we were privileged in listening to Professor Walter G. Whitman '17, Head of Chemical Engineering at Technology, tell us of the latest happenings at the Institute and to

Thomas Midgley, Jr., chairman of the board of directors of the American Chemical Society, tell us of his researches in glands. We shall remember this annual meeting a long time. Joy was omnipresent.

April 7 — Through the kindness of A. S. Douglass '08, construction engineer of the Detroit Edison Company, 70 of us, the third largest gathering, enjoyed the privilege of an inspection trip of the Detroit Edison's Conners Creek power plant. This plant was especially interesting just at that time for we not only saw the existing installations in operation, but saw also the new high-pressure boilers and 60,000-kilowatt turbogenerator unit which were then in construction. This was indeed a rare opportunity to see modern power generating equipment in the "skeleton." We met at 6:30 P.M. for dinner at the Edison Boat Club which is on the river frontage of the power plant property. Here we not only enjoyed a fine meal prepared by the Boat Club chef, but also some good old brew which Fred Haas '34, assistant brewmaster of the Pfeiffer Brewing Company, had sent over with his compliments. It was indeed another unforgettable evening.

April 20 — Professor E. H. Schell '12, Head of M.I.T.'s Department of Business and Engineering Administration, was coming to Detroit and we were happy in arranging a special party for him. Thirty men gathered at the Intercollegiate Alumni Club to meet with and to hear Professor Schell. His remarks about the new Tech activity, sailing, were especially interesting. We greatly enjoyed his visit.

May 12 — This, our final dinner meeting, was a very fitting climax to a most successful season, for we had as our honored guest Dr. Karl T. Compton. We, in Detroit, always feel an exhilarating tingle when we are privileged to meet with Dr. Compton. His delightful personality, his understandable discourses on a variety of subjects, his very presence give us an inner lift. For this fortunate opportunity 50 Technology men gathered at the Intercollegiate Alumni Club. — JOHN E. LONGYEAR '26, *Secretary*, 2000 Second Avenue, Detroit, Mich.

### *M.I.T. Club of East Tennessee*

The Club had a very good meeting on the evening of May 1, with 33 members present. All officers were reelected and George E. Sylvester '87, the oldest member, was honored by being elected honorary president. Professor Sherman M. Woodward, chief water-control planning engineer of the TVA, was the guest speaker and his subject was "Broad Engineering Aspects of the TVA Program." — ALBERT S. PEET '09, *Secretary*, Knoxville Glove Company, Knoxville, Tenn.

### *Technology Club of the Philippines*

This is certainly a Technology year for us in the Philippines. I believe this is the first time we have been privileged to



entertain Technology professors here in the Islands. It is a treat to the local Club. We had Professor and Mrs. Turner last February and now we have Professor and Mrs. Jackson.

Professor and Mrs. Turner were guests of the University of the Philippines. Professor Turner's lectures were very well attended and it's certainly a great advertisement for Technology to have such a distinguished scientist as one of her professors. The Club gave Professor and Mrs. Turner a luncheon in one of the leading hotels in the city and some of our members showed the Turners around Manila and the neighboring provinces.

Professor and Mrs. Jackson are still with us. At this writing they are up in Baguio, the mountain capital of the Philippines—a temperate city in a tropical country. The Club is seeing to it that the Jacksons see the Philippines before they return to Technology. On the 13th of April, Professor Jackson was the guest speaker of the Philippine Association of Mechanical and Electrical Engineers. The engineering fraternity at the University of the Philippines gave a tea in the Jacksons' honor at which the guests were entertained with Filipino native songs and dances.

With Japanese, Chinese, and Philippine clubs, I think an eastern trip of President Compton is in order. We are looking forward to meeting the President and Mrs. Compton in the near future. — B. P. ABRERA '32, *Secretary*, P. O. Box 2559, Manila, P. I.

### *M.I.T. Club of Northern New Jersey*

The annual banquet and election of officers was held at the Newark Athletic Club, Newark, N. J., April 1. About 125 Alumni of the district gathered to hear Professors Edward L. Moreland '07 and Robert E. Rogers who were introduced by Dr. Frank B. Jewett '03, President of Bell Telephone Laboratories and a member of the Club's advisory committee.

Colonel Moreland is well known locally, particularly for his engineering of the electrification of the Lackawanna Railroad suburban system. His interesting discussion of Institute and Alumni affairs, sprinkled with his characteristic humor, constituted not only a complete report of Technology today, but also served to win for him our earnest devotion in his newest capacities as the head of the Electrical Engineering Department and president of the Alumni Association. The story of President Compton's induction into the Tavern Club was but one of the many high spots in a thoroughly enjoyed and much applauded speech.

In introducing Professor Rogers, Toastmaster Jewett took the opportunity to pay a very sincere tribute to the Institute's Department of English and History. Professor Rogers responded with an equally straightforward appreciation of Dr. Jewett's exposition of the value of the spoken and written word. The subsequent pungent comments on other topics of a

lighter vein and particularly the references to his visit to this portion of New Jersey in 1911 as a member of the Maude Adams company were the cause of much merriment.

J. Frank Maguire '17, the retiring President of the Club and its cofounder with Winfield I. McNeill '17, presided at a short business meeting and received the reports of Secretary McNeill, Treasurer William J. Grady '22, William B. Coleman '24, chairman of the nominating committee, and E. J. Thimme '23, chairman of the bridge tournament committee. Door prizes of Glolite platinum-screen cigarette lighters were won by Ormond W. Clark '21, John T. McCoy '24, and Wallace B. Tibbets, Jr., '31. Song leading and cheers were directed by J. H. Teeter '22 and A. W. Lunn '09.

The new officers of the Club are: Winfield I. McNeill '17, President; Everett W. Vilett '22, William J. Lutz '23, and A. Raymond Brooks '17, Vice-Presidents; Carole A. Clarke '21, Secretary; Gordon C. Pearson '33, Assistant Secretary; William J. Grady '22, Treasurer; J. Frank Maguire '17, Arthur W. Lunn '09, Milton M. Manshel '22, Gordon G. Holbrook '10, and Edmund J. Thimme '23, executive committee. — The Advisory Committee consists of Dr. Jewett, Allan R. Cullimore '07, Joseph P. Maxfield '10, Rufus E. Zimmerman '11, William J. Orchard '11, and William H. Price, Jr., '14. — CAROLE A. CLARKE '21, *Secretary*, 10 University Avenue, Chatham, N. J. GORDON C. PEARSON '33, *Assistant Secretary*, Colgate-Palmolive-Peet Company, 105 Hudson Street, Jersey City, N. J.

### *New Haven County Technology Club*

The joint meeting of the New Haven and Hartford Clubs was held on May 9 at the Waterbury Country Club. Forty-four men sat down to dinner, 25 being from the New Haven Club, 17 from the Hartford Club, and the other two, the guest speakers. The meeting was under the direction of Wilbert M. Gilman '24, who certainly carried out his assignment to perfection.

We were particularly fortunate in having two representatives from the Institute as guests: J. Rhyne Killian, Jr., '26, Editor of *The Review*, who gave an extremely interesting talk on the activities of the Alumni, pointing out that in January of this year the Alumni Association celebrated its 60th anniversary. He gave a complete history of the organization from its inception and pointed out the tremendous influence it has had in furthering the value of Technology. Such things as the original state aid, the introduction of courses in aeronautics, Course XV, the establishment of a civil engineering camp, and the sponsoring of the endowment fund of 1917 to 1921 are some of its outstanding achievements. Mr. Killian talked at some length on Alumni Day and as a result of this talk it was expected that a number of men from the two clubs would be present.

Dean Prescott '94 gave the very latest

information on the affairs of the Institute and pointed out the new stabilization plan for enrollment and the new entrance requirements. The group was very much impressed with the broad vision and youthful ideas Professor Prescott has maintained throughout the many years he has been associated with Technology.

The day these notes were written a beach party was held by the Club at West Haven with Marshall Wellington '16 acting as host. — ALBERT S. REDWAY '23, *Secretary*, Farrel-Birmingham Company, Ansonia, Conn.

### *Technology Club of New York*

The 75th anniversary of the founding of Technology was celebrated by the Club at a formal dinner held in the main ballroom of the Waldorf-Astoria Hotel on May 6. President and Mrs. Compton headed the list of over 500 persons who were present. After a short introductory speech in which he welcomed the guests and explained the objectives of the Club, Alfred T. Glassett '20, President of the Club, introduced Gerard Swope '95, who in turn introduced President Compton.

President Compton traced briefly the 75-year history of the Institute and outlined his plans and hopes for its future. In order to show the vast advantages which society receives from an institution like M.I.T., he compared Technology's benefits with what benefits might be expected from the Passamaquoddy project in Maine. Both of these he explained are of approximately the same monetary value, namely, 48 million dollars. In the case of the Institute, however, he pointed to the vast contributions made by its Alumni in almost all fields of human endeavor; of the scientific and technical conquests; of the advancement of the arts; and of the myriad other benefits which accrued to society through the operation of Technology. The Passamaquoddy project, on the other hand, he said, when and if completed, will produce power, according to present estimates, at a higher rate per kilowatt hour than would be produced by a steam plant of the same cost. In other words, he concluded, expenditures on such projects as the Passamaquoddy were unwise, as far as ultimate benefit to society was concerned, whereas money spent on institutions like M.I.T. brought a maximum benefit to society.

Mr. Swope then introduced William D. Coolidge '96, who spoke on "Our Duty to Society." Dr. Coolidge pointed out that although scientific progress and engineering development tend to create temporary unemployment, in the long run the result is an increase in the standard of living from which all benefit. He explained that there still exist tremendous fields for improvement in the future, and that the world looks to science for these improvements.

As concluding speaker, Mr. Swope explained the excellent manner in which the Technology Loan Fund is operating, and

issued a call for younger men to furnish ideas and plans for the progress of the Institute.

After the speeches a colorful review with a chorus of 50 beautiful girls was presented. This entertainment was staged by Clark Robinson '17. During the evening organ music was played by Miss Mary Downey. Songs and cheers were led by Orville B. Denison '11.

On May 4 President Glassett announced that the Club would sponsor the Technology Club of New York Sailing Trophy, to be awarded annually to the student at the Institute who shows the greatest improvement in the art of sailing. Sailing is the newest, and from all reports the most popular, undergraduate activity at the Institute. Professor Schell '12, who has taken a prominent part in establishing the sport at Technology will name the committee to award the silver cigarette case.

During the week of May 25, the final match between the bridge teams of the Club and of the Tech Club of New Jersey was held. With the coming of summer, the Club will curtail many of its social activities. The past season has been a very successful one. Membership has increased to a new high, attendance at all functions has been large, and the important work of placement of Technology men in this area has been so successful that, as President Glassett announced at the banquet, it not only no longer presents a problem, but now the tables have turned and there are more positions brought to the attention of the Club than there are applicants to fill them.

During the summer the Club headquarters at 22 East 38th Street will be open at all times and members are invited to make use of the club rooms and facilities. Technology men visiting this area are cordially invited to visit the Club. — ASHER L. WEIL '01, *Secretary*, 22 East 38th Street, New York, N. Y. CONSTANTINE S. DADAKIS '34, *Publicity Committee*, 644 Riverside Drive, New York, N. Y.

### *Technology Club of Paris*

The Paris group is a little too weak numerically to maintain any very active program, but the Secretary had reported to headquarters that they do occasionally think of Technology, and on Friday, May 1, President Welles Bosworth '89 called those who were in town for a gathering at the University Club, and as usual he was in grand form and entertained the group no end from his limitless fund of anecdotes. In addition to Mr. Bosworth four others were present: E. Arthur Baldwin '96, George W. Bakeman '13, Lester T. Forbes '14, and Kenneth B. White '20. — GEORGE W. BAKEMAN '13, *Secretary*, Rockefeller Foundation, 20 Rue de la Baume, Paris, France.

### *M.I.T. Club of Western Pennsylvania*

At the meeting at the University Club, April 21, one of our own members, R. A. Miller '16 was the speaker. Miller, who is

technical sales engineer of the Pittsburgh Plate Glass Company, spoke about plate and safety glass, explaining the difference between the two kinds of glass. His talk was very interesting and with the slides shown and the breaking of test pieces of glass was instructive and educative as well. — As there will be only a few more meetings this year, Mal Davis '25, our President, appointed J. C. Whetzel '17, George Ousler '16, and Bill Reed '27, members of a nominating committee to make suggestions for officers for this coming year. — E. J. CASSELMAN '15, *Secretary*, Mellon Institute, University of Pittsburgh, Pittsburgh, Pa. E. A. SOARS '21, *Assistant Secretary*, Townsend Company, New Brighton, Pa.

### *Technology Club of Virginia*

The Virginia Alumni will be glad to learn that the president of our Club, Donald N. Frazier '11, was elected to the national nominating committee of the Technology Alumni Association. Don won out in a three-cornered race to represent the southeastern part of the United States, designated District Number 6.

The local club in the Richmond district to date has been most active. They have held two very successful monthly luncheon meetings. These meetings will continue to be held on the fourth Monday of each month at the Westmoreland Club. If any visiting Alumni happen to be in Richmond on luncheon day, we would be glad to have them join us. We would also like to see more of the local Alumni avail themselves of this opportunity to get together.

We are looking to the Newport News and Norfolk Clubs to be actively organized in the next few months. It is hoped that a semiannual meeting of the parent Virginia Club can be arranged at one of these resort towns during the summer. We have obtained national recognition through our President as noted above. Let's get together down here and back him up with an honest-to-goodness active alumni club. — JOHN J. FAHEY '29, *Secretary*, care of Virginia Electric and Power Company, Richmond, Va.

### *Greater Salem Group*

The last dinner meeting was held at the clubhouse of the United Shoe Machinery Corporation in Beverly and was very well attended, there being over 80 Alumni present. Tickets for the occasion were sold in advance, and we found this to be a very successful means of insuring a large attendance. Dinner was served buffet style, after which we had the pleasure of listening to two very interesting speakers: Dr. Moreland '07 and Professor Reynolds '25, who spoke on the Cape Cod Canal project and flood control. The business of the meeting consisted in electing Burton G. Philbrick '02 as our unofficial representative to the Alumni Council. — JOHN D. HOSSFELD '35, *Secretary*, 23 Hale Street, Beverly, Mass.

### *M.I.T. Club of Northern California*

It is with regret that we note the decease on April 5 of Samuel Abbot '75. The following clipping is from the San Francisco *Examiner*: "Samuel Leonard Abbot, Sr., retired San Francisco banker and head of a well-known California family, died at his home, 2118 Vallejo Street, yesterday, following an illness of several months.

"Born in Boston, Mass., Mr. Abbot came to San Francisco in 1876 and began his career in the banking business. He was president of the old Security Savings Bank, having been connected with that institution for 40 years, until it was taken over by the former American National Bank of San Francisco. He then became vice-president of the American National and retired about nine years ago.

"His widow, Mrs. Jeanie Ogden Abbot, and one son, Samuel Leonard Abbot, Jr., survive. . . ." — D. D. DONALD '25, *Secretary*, 140 New Montgomery Street, San Francisco, Calif.

### *Technology Club of Central Florida*

The Club held a meeting on April 7 at Clearwater. Bathing in the Gulf and golf were the principal forms of sport in the afternoon, followed by dinner at the Clearwater Yacht Club. After dinner the annual meeting was held and the Club listened to informal talks by Harvey S. Chase '83 and Harold Coes '06.

The following Alumni attended: Harvey S. Chase '83, Harvey M. Mansfield '83, Theodore H. Skinner '92, James Talbot '96, A. N. Morton '04, Harold Coes '06, Franklin O. Adams '07, A. C. Nichols '08, J. J. R. Bristow '14, Fred D. Mendenhall '14, Laurence P. Geer '15, M. J. Mackler '17, W. B. Newell '17, M. R. McKinley '19, Richard D. Jackson '24, John M. Kohr '35, Alfred D. Reed '35. — MALCOLM R. MCKINLEY '19, *Secretary*, Tampa Electric Company, Tampa, Fla.

### *Technology Club of Lower Ontario*

The annual dinner meeting of the Club was held at the Granite Club, Toronto, April 3. The meeting was fairly well attended considering the fact that a good many of the members live some distance from this center. Showing the enthusiasm of at least one of our Alumni, George Wedlake '28, drove from Brantford and returned there after the meeting, which necessitated a trip of about 100 miles.

The Secretary read President Compton's letters of December 17 and March 10, which outlined in detail the progress being made at the Institute, including the important changes being contemplated in the curriculum. We were very pleased to see how progressively the Institute is moving forward under President Compton's able and enthusiastic direction. The Treasurer then submitted his annual report which showed a small but favorable balance in the treasury.



At this meeting nominations were made and officers elected for the ensuing year, as follows: President, H. S. Chandler '08; Vice-President, A. R. Holmes '00; Secretary, C. W. Sampson '29; Treasurer, B. H. Morash '12. The executive committee is as follows: H. H. Tozier '96, J. S. Keenan '23, and T. L. Gledhill '26. Appropriate remarks were made by Dr. Gledhill, the retiring President, and by Harry Chandler, the new incumbent.

A discussion was carried on covering a program for the next meeting which might take the form of a golf tournament and include some color movies of a proposed trip to California and the Coast by our most accommodating Mr. Tozier. One of the Institute's outstanding graduates is Charles Camsell '09, Deputy Minister of Mines for the Canadian government at Ottawa, and an effort will be made to secure him for one of our future meetings.

We had endeavored to secure, as a guest speaker, the Hon. C. D. Howe '07, Minister of Railways and Canals for Canada, but unfortunately Parliament was in session and very important measures being piloted through the House required his continuous presence. We hope to have him with us at a later meeting.

Valentine Wilson '28, gave a most interesting talk on the aluminum industry, from the raw material to the finished product. The talk was illustrated with slides and this was followed by a movie showing the reconstruction of one of the important bridges at Pittsburgh, which allowed keeping in use a 50-year-old bridge to take care of the increased load for another 25 years, at a great saving over the cost of a new bridge.

Mr. Tozier then showed a movie of the professional golf played at our tournament last summer and another movie in color of a trip to the Delaware Water Gap, Pocono Mountains in Pennsylvania, also including views of New York, Washington Bridge, and Yale University buildings and grounds. Both Mr. Wilson and Mr. Tozier contributed greatly to the pleasure and enjoyment of the evening.

Those present were: John Buss '26, Charles Sampson '29, Edward Woodworth '97, Henry Tozier '96, Henry Patten '08, Bernard Morash '12, Harry Chandler '08, George Wedlake '28, John Keenan '23, Thomas Gledhill '26, David Rogers '15, Reginald Peene '23, Valentine Wilson '28, Louis Black '14, Strathy MacKellar '12, David Johnston '26, Archibald Holmes '00, C. P. Beaubien '34. — BERNARD H. MORASH '12, *Secretary*, 137 Wellington Street West, Toronto, Ont.

### *Worcester County Alumni Association of M.I.T.*

The spring meeting of the Association was held at the Bancroft Hotel on Tuesday, April 28, with 65 Alumni in attendance. A good time was enjoyed by all those present, particularly the showing of the moving pictures of the crew race on Lake Quinsigamond, which was reenacted on the floor of the Crystal Room of the hotel by three four-man crews

representing Yale, Syracuse, and M.I.T. Unfortunately, as at the regatta, M.I.T. came in last.

Everyone enjoyed Charlie Locke's discussion of the current M.I.T. events and listened intently to Tubby Rogers' serious (?) discussion of Institute affairs. Tubby seemed to have quite a little difficulty in keeping a forced draft on his pipe and burned up all the matches the Bancroft Hotel had in stock.

Those present were: Professor Robert E. Rogers of the English Department and Professor Charles E. Locke '96, Alumni Secretary (guests); Frank W. Bemis '25, Erving G. Betts '18, Waldo E. Buck '76, Percy J. Colvin '07, James A. Cushman '03, Fred H. Daniels '11, Orville B. Denison '11, M. George Green '33, M. M. Green '21, William A. Hyde '04, Forrest F. Lange '23, Arthur J. Lariviere '35, Harry M. Latham '93, Charles H. Lusk '23, George D. Manter '31, Myles Morgan '23, Norman C. Nelson '30, Carleton A. Read '91, Harold L. Robinson '11, Percy M. Roope '27, Richard R. Snow '31, Howard R. Stewart '17, Henry R. Tomlinson '22, John L. Tufts '99, Louis E. Vaughan '02, Lewis S. Vose '16, Ernest P. Whitehead '20, William A. Wilder '98, Bruce Bennett (Penn. State '33), J. B. Lowell (Colorado Mines '07), and R. L. Whipple (University of Vermont '06), all of Worcester.

Still others present were Howard F. Atwood '32 of Bolton; William M. Bassett '02 of Boston, club representative on the Council of the Alumni Association; Angelo M. Altieri '29, Charles E. Cashman, Jr., '33, Fred N. Dillon '93, Morris Elston, Russell B. Lowe '02, and Andrew B. Sherman '06, all of Fitchburg; Harry S. Kendall '04 and Roger R. Smith '27, both of Gardner; Philip L. Hatch '26 of Leicester; Maurice C. Beren '28, Jules Friedman '27, Bernard S. Falk '23, George W. Falk '32, Herbert L. Hayden '23, Clarence M. Joyce '03, Eli Lurie '22, John J. May '30, and Robert J. Proctor '28, all of Leominster.

Also, Walter R. Vitalini '21 of Milford; Charles E. Allen '07 and Edmund H. Squire '07, both of Spencer; Carl H. Wilson '34 of Webster; Arthur G. Anderson '30, W. Franklin Baxter, Jr., '34, Alanson G. Bowen '33, George J. Brady '32, Robert Larson, Jesse E. Jones, Jr., '22, John E. Perry '34, and E. A. Teeson, '15, all of Southbridge. — E. A. TEESON '15, *Secretary*, American Optical Company, Southbridge, Mass.

## CLASS NOTES

1873

The following interesting description and reflections on student life at the Institute from 1869 to 1873 was written around the year 1913 by the late A. W. Johnston, former Secretary of the Class. These were recently turned over to the present Secretary for inclusion in *The Review*. Although many of those mentioned herein have passed on, the rich spirit of service and loyalty still survives.

"A freshman of '69, he who entered the 'Old' Institute in the fall of 1869, had a very different vista, physiographic and technical, from the freshman of 1913. The Institute was then four years old — a very sturdy youngster, however, possessed of all the faculties, physiological and physical, required for mental activity and locomotion.

"Dr. Eliot had just left the M.I.T. to lead Harvard into many years of influence. Dr. Storer was yet in charge of chemistry; Professor Pickering presided over the physical laboratories, assisted by John Trowbridge; Charlie Cross was a fledgling professor and mixed up German, physics, and mathematics. Ferdinand Bocher, delightful man he was, left us to go to Harvard, after cautioning the young men that it might be safe to use a 'pony' if it did not run away. Billy Atkinson (peace to his ashes) read good English to us and was oblivious of the hilarity caused by his observations on the various historical essays in which he sought to interest us. Dr. Kneeland, in addition to his duties as secretary, farson, dean, and other things, gave lectures on several kinds of ologies. John B. Henck, Jr., he of the field book, drilled us well in precision of instrumentation in field work and in the use of spring balance for taking up slack in tape measuring. He was ably seconded by instructors drawn from the earlier classes.

"I remember, among others, William E. Hoyt '68, now on the New York Central Lines' staff, and I. S. P. Weeks of '71, in after years chief engineer of the Burlington Lines in Nebraska, now passed away.

"The Rogers Building was then on the frontier of Back Bay residential growth — all beyond toward Brookline and the old Mill Dam Road (Beacon Street extended) being but partially filled. . . . Mathematics in the freshman year troubled some of the men a good deal and I remember that one of our instructors was inveigled into solving the area of a triangle where the sum of two sides was less than the third.

"The freshmen of '69 came from all parts of the country, the radius of attendance reaching to New Brunswick on the east and to California on the west, the larger proportion coming from New England. There was no social atmosphere. Many of the men lived out of town, coming and going daily, and there was no inclination to get together in any college sense. . . . There was an English literature course, which enabled some easy-going souls to keep on the roster, and German and French had their regular innings, and occasionally Spanish looked in the classroom door.

"Military drill was a requirement of the freshman year, and twice a week the battalion maneuvered in Boylston Hall, over the old Boylston Market, and the Tech uniform cap was a distinguishing mark of the freshman and sophomores.

"Technical education on the Rogers basis was a new departure, and students of the science as applied practically were expected to be enthusiastic in their desire

1873 Continued

for such a preparation for active life as the Institute was then undertaking to give. I do not think it too much to say that nearly every student who joined in '69 had a real definite purpose and had chosen his professional path when he entered. — We all remember Mrs. Stinson, who had charge of the chemical laboratory supply room, and her marvelous faculty of remembering and placing students.

"There was nothing of marked interest or importance to bring the Class of '69 to '73 into special prominence during its freshman year, but during its second year, it got together and made its presence known by its activity as a class. It formed a class organization and celebrated the close of its second year by a dinner which has been repeated every year since. It claims (and I think with substantial reason) the credit of initiating the original suggestion which led up to the formation of the Alumni Association.

"Two of its members became prominent in Institute organization work, namely, Dr. Williams and Webster Wells, later Professor of Mathematics. Colonel Henry L. Ripley, now retired, entered the regular Army in 1876, and had a successful and soldierly career both at home and in foreign service in the Philippines and in Cuba." — GEORGE M. TOMPSON, *Secretary*, 8 Whittemore Terrace, Wakefield, Mass.

## 1876

Albert H. Low, who was born in Chelsea, Mass., June 27, 1855, died at his home in Denver, Colo., on April 9. He was graduated from the M.I.T. with the Class of 1876, Course V, with the degree of S.B. Soon after his graduation he went to Denver and organized the assaying and chemical firm of von Shultz and Low. From 1919 to 1926 he was the head of the chemistry department of the Colorado School of Mines, at first dividing his services between the School of Mines and consulting practice, but later giving his whole time to the school. The degree of D.Sc. was conferred on him by the Colorado School of Mines in 1922. He was founder member of the Colorado Scientific Society and a contributor to scientific journals. — CHARLES T. MAIN, *Secretary*, 201 Devonshire Street, Boston, Mass.

## 1877

In the October, 1935, issue of The Review there was a letter from Francis H. Bacon of Chanakkale, Turkey, and we are very glad to include here his latest one, addressed to the Secretary on March 17: "Your letter of January 13 reached me too late for a reply to get to you before you left for Mexico. I suppose by this time you are back with some fine strips of color movies and memories of Aztecs, brigands, bananas, Popocatepetl, and such. . . . I wrote you some time ago about Zalinski: meeting him in New York at the Century Club — but that was long ago!

"This spring the excavations start again at Troy — by the expedition sent by the University of Cincinnati under Dr.

Blegen. This is the fourth season and as the members are all good friends, they bring new life into the place. They are very keen on laying bare the Troy of Homer, and completing the work begun so long ago by Dr. Schliemann and Dörpfeld. I knew these explorers, as I came to Troy first in 1879 when on that yacht trip through the Aegean. Now, on my beam ends, I sit and look on from the side lines, but there is one worth-while thing I have been busy with during the past few years: I have been much in Athens and the museums of Smyrna and Constantinople, and have been making full-sized rubbings and details of Greek architectural fragments. In 1929 I had a winter in Rome and Naples, and in 1931 a gorgeous six weeks in Rhodes, where I filled my portfolios with details. All these collections will be deposited in the library of the American School of Classical Studies in Athens where I hope future Technology architects will consult them and carry on the work I have begun, for with all the recent excavations in Greece there are heaps more details to make. . . .

"I don't envy you these next few months — political rallies, bands, orators, strikes, and general hell to pay in Europe, Asia, and Africa. Guess I'll stop thinking about it, wind up this letter, get into my easy chair, and read Herodotus. . . .

"Poor old '78 nearly all cashed in. I had a letter from one of the members — only two at the last dinner. I always went to '78 dinners as I knew them all, but old Father Time gets us when our time comes."

George Bartol, member of our Class, died, April 3, of influenza after an illness of several weeks at his home, 11421 Bellflower Road, Cleveland, Ohio. The burial was in Lancaster, Mass. Bartol was born May 16, 1857, at Lancaster, the son of George Murillo and Elizabeth (Washburne) Bartol. The latter was the daughter of John M. and Harriet W. Washburne. George was the oldest of six children, four of whom are now living: Elizabeth (Mrs. Harold Parker) of South Lancaster, Mass.; John W. Bartol, a celebrated physician of Boston; Mary Bartol of Lancaster; Edward W. Bartol, M.D., Lancaster. His father filled the pulpit of the First Unitarian Church in Lancaster for 59 years. This church was designed by Bulfinch, the architect of the front of the State House in Boston. George Bartol's uncle, Cyrus Bartol, was a leading Unitarian clergyman for many years in Boston.

George was educated in the public schools of Lancaster preparatory to entering M.I.T. He was graduated a mining engineer and in 1878 was employed as chemist at the Otis Steel Company, Cleveland, Ohio, analyzing metal from the open-hearth furnaces. He was named American manager of the Otis Steel Company in 1897; six years later two thirds of the Otis stock was sold to a British Syndicate. In 1898 George was elevated to the presidency of the company and served until 1925 when he was retired. He has since been vice-president,

but was not active in business in the last several years. He was one time president of the Colonial Realty Company and the Warren Realty Company, and director of the First National Bank and Trust Company of Cleveland, Ohio. He was a member of the American Institute of Mining Engineers and the American Society of Mechanical Engineers. He was a member of the Union and University clubs and the Cleveland Engineering Society.

He married Nellie Holt, June 12, 1898. Two children were born: Eleanor, October 31, 1901; Elizabeth, November 7, 1902. Eleanor married Dr. I. F. Weidlein of Cleveland, August 26, 1931. They have one child, Eleanor Weidlein. Bartol's daughter, Elizabeth, never married; she lived at home with her father. George's wife died some years ago. He wrote papers on developments in iron and steel manufacturing. He held no political or social offices. His active participation in sports covered a wide range. His principal hobbies were golf and automobilizing. In his garage he had a machine shop and in it he made most of his repairs. Also of a scholarly bent, he continued a deep interest in classical literature into his later years. — BELVIN T. WILLISTON, *Secretary*, 3 Monmouth Street, Somerville, Mass.

## 1884

As stated in a previous issue of The Review, the portrait of Tyler painted by Hazelton '94 has been received. Due to the serious illness of your Secretary, who was to have made the presentation on Alumni Day, Dean Prescott '94 acted in his place. The portrait was accepted for the Institute by Professor Phillips, Head of the Department of Mathematics. — AUGUSTUS H. GILL, *Secretary*, Room 4-053, M.I.T., Cambridge, Mass. S. S. DEARBORN, *Assistant Secretary*, 4 Newport Road, Cambridge, Mass.

## 1888

Our 48th class dinner since graduation and 7th Ned Webster Dinner since the depression, was held at Webster's Chestnut Hill estate on June 6. It was the best dinner of all with the rarest flowers on display and a grand "talk-fest" afterwards, but as these notes have to be written two weeks before the date of the dinner in order to appear in the July Review, we will have to ask you to wait for the November issue for the list of those present and added features besides those regular characteristics as given above.

Flood news from one of our '88 staff correspondents in South Newbury, Vt., Walter S. Dodd, was delayed by high water so that it was prevented from appearing in the May issue with our Lowell and Lawrence reports. However Walter says: "The Connecticut rose here about five feet above the 1927 record, but the bridges stand except the middle span of the Thetford bridge which was carried away. Our dam, on which we depend for light and power, was smashed, the first time in 40 years. The most interesting occurrence was the success of the flood



1888 Continued

dam at Orange, up stream from Barre and Montpelier, that 'damn Democratic dam.' Those towns had flood enough but would have been destroyed if the water held by the dam had come down. In the cross-state road the water is 20 feet deep back of that dam, but nobody cares. The unfinished dam would have saved Waterbury. The Fifteen Mile Dam handled the flood without trouble."

In The Review for April in the article "Technology Revisited," page 284, is shown our tug-of-war team that "pulled" Harvard after they had beaten Yale and Princeton at Mott Haven in 1887. The men shown in the illustration are: standing, R. M. Clement and H. G. Gross; seated, F. L. Pierce and P. H. Tracy. We find in our files a clipping from the Boston *Herald* of March 5, 1887, describing the indoor open meeting of the Technology Athletic Club on the previous day when our team defeated Harvard; it is well worth repeating: "The announcement of the final tug-of-war by Technology and Harvard awakened keenest interest. Several false starts were made. Finally, with the ribbon exactly on the line, the word was given. The anchors dropped to their places, and Tech had won three inches. Easton's (Harvard anchor) short heaves began to tell, and for a few moments it seemed that Harvard had a slight advantage. Pierce and his three steady athletes remained firm, however, and would not give an inch. During the last minute each team strained every muscle, Harvard to obtain a lead and Technology to hold that already gained. Fifteen, 30, and 45 seconds were called, and then time, and the almost invincible Easton and his Harvard team were for the second time beaten by a Technology team. Tech had won by two-and-one-half inches. The members of the victorious team were borne triumphantly to the dressing room on the shoulders of their friends, and the applause and cheering were deafening." The old Exeter Street gymnasium was filled to overflowing, and we of '88 thought it almost a class victory as we had two classmates on the team for one from each of two other classes, although we will admit that Pierce '89 deserves most of the credit for gaining three inches on the drop and hanging on to it for four long minutes. It was one of the few occasions that Technology defeated Harvard in what was at that time a major sport.

Our genial globe-trotting classmate, Ben Buttolph, has recently completed another comprehensive trip, leaving New York with Mrs. Buttolph on February 13 and traveling via Panama Canal they arrived in Los Angeles. . . . There they visited friends for two weeks and then Mrs. Buttolph returned by water while Ben returned via San Francisco, Denver, and Chicago. In San Francisco he had a visit with our old tug-of-war and baseball star, Russell Montague Clement, who is doing construction work for the city of Oakland. His oldest son, Lewis M., is a noted radio expert and is a vice-president of Radio Corporation of America in the research department in

Camden, N. J. He spent four years abroad with International Radio. He has another son, Ralph, in Los Angeles who is a lighting specialist in Hollywood studios. Ben inspected the Bay Bridge from San Francisco to Oakland. The last gap in the Oakland side to the island will soon be closed. In Denver he called on Frank Ladd who is as robust as ever but he said business in his line was a little quiet now. He also saw Frank Shepard, '87, former director of the mint, who was major of our freshman battalion in 1884-1885. Ben has started your Secretary on a still hunt for some trace of Stephen Child whose last known address is 538 Merchants Exchange Building, San Francisco. He has written to Ben's engineer-in-charge in San Francisco to visit the above building and try to find out where he went from there and so find out all possible in regard to Stephen which will be reported in the next issue of The Review.

We will close this season's notes with nine characteristic items by our Hartford staff correspondent, George Ulysses Grant Holman: (1) "Harry Horn was blessed with plenty horse sense and was a grand comrade. His father thought he should not serve on the *Technique* board as it might interfere with his more serious studies. So we of the board lost an able colleague." (2) "Eddie Fuller was very fond of that bulldog of his — brought him into lectures, but the dog was good so no complaint from professors nor instructors." (3) "Binney was a personage. He had such a wonderful mental equipment that he didn't do much studying as some of us were compelled to do. In quizzes he would answer the professor's question by asking him another. And so the poor professor didn't know whether Binney knew his stuff or not. His examination grades were always very high. He had an umbrella with a trick handle showing an Ethiopian head. By moving a lug on the side a red tongue shot out. Binney was invariably the last man in Professor Cross's physics lecture prior to the door being closed and locked. Cross was observant. One day just as the assistant was about to close the lecture room door Mr. Binney slipped in with his accustomed grin. Cross was shuffling his lecture notes, looked at Binney, turned to the class, and said, 'I see we have the late Mr. Binney with us.'" (4) "Dick Devens was a quiet chap and a grand baseball and football player when M.I.T. used to have varisty teams in those sports." (5) "Fred Ellis was another quiet chap who played good football along with Frank Ladd." (6) "Francis Laurens Vinton Hoppin was an outstanding member of our Class during our freshman and sophomore years. He always had something to say worth saying." (7) "Charlie Stone and Ned Webster were the Damon and Pythias of '88 from the first section meeting. They devoted their time to study which resulted in honors. Both were affable chaps to their fellow classmates." (8) "George Clafin was always advancing some idea which could be used for the glory of 1888. He was a prominent

member of the '88 Double Quartette of which Fay was pianist and Means, leader." (9) Ulie Holman claims that he knew more classmates than anyone else in the Class, for as secretary of the "Society of '88" and advertising manager of *Technique* he solicited all to join the "Society" and thus got acquainted with over 95% of the Class early in our career. He did a fine job in getting advertisements for *Technique*, thus providing money to pay the printer.

In closing, the Secretary says: "Come on down to Chebeague Island and have a game of golf with me as my guest." — BERTRAND R. T. COLLINS, Secretary, Chebeague Island, Maine.

## 1890

Notice has been received of the death on September 13 of Harrison S. Buffum, who was a resident of Providence. After studying for a short while with '90, he entered the School of Design and then began work as a draughtsman in an architect's office. Later he worked with various concerns, but his health was not good, and in 1915 he went to the Brattleboro Retreat where he was at the time of his death. He is said to have been a great reader, always well informed on current events, and much interested in all the new books. He had many friends in Providence. He never married. — The Secretary has also received word of the death of the Rev. Henry Mesier who was with us for a short time the first year. He was graduated from the General Theological Seminary in 1896 and was rector of churches in Far Rockaway (Long Island), Kingston, Fredonia, and Buffalo, N. Y., Netherwood, N. J., and at the time of his death was at St. Thomas Church, Farmingdale, Long Island. He died over a year ago.

The *Church Militant* for November announced the retirement on pension of the Rev. Willard Holt Roots, Diocesan Missionary at Mansfield, Sharon, Foxboro, and environs for the past 18 years. Roots taught school after leaving the Institute, then spent some time building dams in Washington, for two years was in Tennessee, and spent one year in Arkansas. In 1898 he was graduated from the Episcopal Theological School and has been doing mission work ever since. His early experiences in northern Washington where he covered about 10,000 miles on horseback were quite strenuous. Later he had headquarters in Idaho and in Washington until he came East in 1917. His two children were born in the West, and his daughter, Frances Mary, who has a master's degree from New York University, is now dean of girls in Washington State School for the Blind at Vancouver, Washington. Willard's first celebration was to go out to see her, taking in Yellowstone Park and revisiting his old circuit. After that he visited relatives in the West, but he is back in Mansfield, Mass., at his old address, 140 Central Street, where we hope he and his wife will continue to enjoy life for a long time. Like most of our fellows who retire, he continues to be fairly busy, and still adminis-

1890 Continued

ters Holy Communion and baptism in Mansfield and Foxboro, and has a service at the Foxboro State Hospital.

The *Mining Journal* announces that Burdett Moody of the Bureau of Power and Light, whose home address is 845 South Plymouth Boulevard, Los Angeles, gave an illustrated lecture on the building of the Boulder Dam, the new power plant, and the construction of the largest transmission line in the United States, at a recent meeting of the Mining Association of the Southwest.

Late in March, De Lancey sent a clipping from the Waterbury *American* announcing the engagement of Miss Frances Lawrence Stiles of Flushing, Long Island, to his son, Darragh de Lancey, Jr., now associated with the law firm of White and Case in New York. He thought this wedding might occur some time in the fall. In the middle of April, the Secretary received a note from De Lancey announcing the engagement of his daughter, Anna Halsted de Lancey, to Charles Singleton Mears of Riverton, N. J., a graduate of Swarthmore College in the Class of 1921, and a partner in the insurance firm of Paulding and Mears of Philadelphia. The daughter is a graduate of Smith College, a member of the Junior League, and associated this winter with the Beaver Country Day School of Chestnut Hill, Mass. The father and mother are almost overcome with the combination of two engagements and two weddings this summer, but are very happy about it. We certainly extend congratulations.

Harry Goodwin sends us the following: "George Hale was recently honored by a symposium arranged by Dr. Harlow Shapley, director of the Harvard Observatory, at which his great contributions to astrophysics, his work as a builder of novel and great telescopes, and his influence on American science through activities in connection with the National Academy of Sciences, the National Research Council, the California Institute of Technology, and the Huntington Library in Pasadena were discussed by scientists intimately acquainted with these various aspects of his work. Among them were Professor Gerrish of the Harvard Observatory, Professor Dunham of the Princeton and Mount Wilson Observatories, Dr. Day of the Geophysical Laboratory of the Carnegie Institution in Washington, and Dr. Goodwin, his old chum at Tech. Unfortunately, Hale himself could not be present, although his extreme modesty would probably have kept him from attending had the width of the continent not prevented.

"Attention is called to a very interesting popular article by Hale in the May number of *Scientific American* on 'The 200-inch Telescope' which gives an excellent account of the progress thus far made on this great project for which he is primarily responsible and on which he is now engaged. It will probably take about four years longer to figure the mirror, which has recently arrived safely at Pasadena, and to mount it as a completed telescope on Palomar Mountain in San Diego County, Calif.

"Although Hale's health is not so robust as one could wish, he is still carrying on at his solar observatory his work on the general magnetic field of the sun with the same keen interest and enthusiasm as ever. Greetings and best wishes to '90's illustrious son!"

Leonard C. Wason has been elected one of the members at large of the Alumni Council. — Charles Hayden has been elected a director of the American Zinc, Lead and Smelting Company. This is probably about his 75th directorship, or more!

On June 9 Niagara University conferred the honorary degree of doctor of laws on Harry L. Noyes, "chief engineer of the Union Carbide Company and prominent Niagara Falls civic leader." The Buffalo *Courier-Express* of May 14 announced that "Harry L. Noyes, who was president of the Common Council of Niagara Falls in 1904 and who some Republicans talked of drafting as mayoralty candidate last year, today was chosen president of the chamber of commerce of Niagara Falls. . . . He became associated with the Union Carbide Company in 1898 and his title now is that of chief engineer. He has charge of all building operations of the corporation here, in West Virginia, Michigan, Virginia, Indiana, and at Welland, Ont." Harry is evidently an example of what the engineer ought to be in civic affairs. He has three daughters, married, one unmarried son, and nine grandchildren, which he thinks is a pretty fair record. We think he ought to be a happy man, and congratulate him!

We hear comparatively little about the doings of '90 men, and it would be very much appreciated if some of you would send to the Assistant Secretary a note on happenings of interest to yourselves or to other members of the Class.

The Alumni Secretary sends the following changes of address: Adolph Hallenberg, Maple and Bluegrass Avenues, Hazelwood, Louisville, Ky.; William L. Murdock, Northwestern Leather Company, 93 Lincoln Street, Boston — for a long time his address was at Sault Ste. Marie, Mich.; S. Rodman Snelling, Ridgway, S. C. Rodman had been living at South Lincoln, Mass., and his old neighbors say they expect to see him back some day. Edward B. Stearns, who has been with the American Bridge Company at 71 Broadway, New York City, has changed his address to 86 Hawthorne Place, Montclair, N. J. — GEORGE L. GILMORE, *Secretary*, 57 Hancock Street, Lexington, Mass. GEORGE A. PACKARD, *Assistant Secretary*, 50 Congress Street, Boston, Mass.

## 1892

Henry L. Johnson writes under the letterhead, "The New England Printer News Craftsmanship Demonstration in the Graphic Arts Industries, 272 Congress Street, Boston, Mass." From Johnson we learned the sad news of the death of one of our classmates, of whom the following account is extracted from the *Bellevue Falls Times* of March 5: "Hartley Dennett died February 28; his wife died only

## THE TECHNOLOGY REVIEW

three days later, both of pneumonia, in the Rockingham, Vt., hospital, not far from their home in East Alstead, N. H. He was born in Saco, Maine, and spent his boyhood and early youth in Maine where he had the great fortune to grow up in a beautiful old Colonial house. This circumstance bore valuable fruit in later years, the boy, unusually sensitive to beauty, drinking in the graceful lines of moldings, mantelpieces, and carvings. Here in the Maine home was laid the foundation of the desire which in his maturity became an unusual architectural talent, making Mr. Dennett one of the outstanding architects of his time. Following graduation he studied at Harvard and from there went to Europe where he traveled extensively for the purpose of studying architecture. He was often heard to remark that he never climbed a flight of steps in Europe comfortably but that he went back down again to take measurements of height and width to find out just why it was so easy to climb. It was this attention to detail and comfort which helped him to go so far in his chosen profession. Upon his return to America he settled in Boston for several years, working as an architect and building the school and church in Waltham, Mass., the library in Danbury, Conn., and a number of beautiful dwelling houses. He was one of the first architects to believe that a kitchen should be built to live in and he incorporated in his houses small kitchens with plenty of storage and cupboard space. He planned his houses from the inside first whereby he made them fundamentally livable and then worked on the exterior, achieving in the end a unity of beauty and utility.

"He was one of the founders of the Boston Society of Arts and Crafts and of the Aberthaw Company in Boston, pioneers in reinforced concrete work. He was also a member of the Twentieth Century Club of Boston. When he moved to East Alstead in 1910 he essentially retired from architecture and devoted his entire time to farming. In recent years he had taken up his profession again and monuments to his work are the J. E. Spurr house in East Alstead, the Messer mill in Mill Hollow, the Three Bears' House in Acworth, the Acworth school, and the present Riordon and Craig houses in East Alstead. At the time of his death he had completed plans for the addition to the Town House in Acworth and was overseeing the work. He was keenly interested in the League for New Hampshire Arts and Crafts. Striking in appearance, his erect figure crowned by a shock of pure white hair which in his youth was red, to meet him was to remember him as a vital and pulsating personality. He was often compared in appearance to the great writer, Mark Twain.

"The Dennetts lived in the beautiful old residence in the Mill Hollow section, which they transformed from the little old farmhouse to the outstanding home that it is today. Filled with beautiful antiques, collected by them over a period of years, flooded with sunshine from the large, many-paned windows, the house



1892 Continued

has an air of hospitality and welcome that is instantly sensed by the veriest stranger who steps inside. Dennett is survived by two sons, Carl of Walpole, N. H., and Devon of New York City, and by one brother, Vaughn Dennett '93 of Saco, Maine. — JOHN W. HALL, *Secretary*, 8 Hillside Street, Roxbury, Mass. W. SPENCER HUTCHINSON, *Assistant Secretary*, Room 6-201, M.I.T., Cambridge, Mass.

## 1893

During April and May death claimed three outstanding members of the Class, Albert Farwell Bemis, Henry Adams Morss, and Charles Nourse Cook.

In the death of Albert Farwell Bemis at Phoenix, Ariz., on April 11, the Class lost its foremost and best loved member and Technology one of her most active and devoted sons. Late in March he and Mrs. Bemis left Boston on a trip to Colorado where both had lived in their youth. His death resulted from a fall which occurred while taking motion pictures at the Grand Canyon. While the fall might not have proved serious for a man in normal health, it was too much for a weak heart from which Bemis had suffered for many months, and notwithstanding that he was taken to a Phoenix hospital, the best of care could not make him survive the shock. Funeral services were held, April 15, at the home of his sister, Mrs. F. M. P. Taylor in Colorado Springs.

Albert Farwell Bemis, son of Judson Moss and Alice Cogswell Bemis, was born in Boston, November 11, 1870. Shortly after his birth his parents established their home in Newton, Mass. In 1881 a serious throat trouble which his mother had contracted made necessary the family's removal to Colorado where, fortunately, she regained her health. Colorado Springs was the family home of his parents until his mother's death in 1917, although business required his father to spend much of his time in Boston. Thus it was that Farwell received his earlier education at Cutler Academy, Colorado Springs, and at Colorado College, prior to entering Technology in 1889. He was graduated with the Class in the Civil Engineering Course, but immediately after graduation he entered the employ of the Bemis Bro. Bag Company. This company had been founded and developed into a truly great institution by his father whose reputation as a sterling business man became nation wide. At first the company's business was the manufacture of bags from cotton cloth; later this was expanded to include burlap (jute) and paper. By the end of the Nineteenth Century the company had become the largest of its kind in the world. Farwell Bemis was secretary of the company for many years, and upon his father's retirement from active work in 1909 he succeeded him as president. By this time jute, grown only in British India, had become a very important material in the bag industry. Farwell established at Calcutta the first American-owned mill in India for the manufacture of jute. This

was put into operation in 1913 and ten years later this company, known as the Angus Company, was employing 6,000 persons in the jute mill and 1,500 more in the machine shop or "engineering works," the finest which had been built in all Asia for the manufacture of mill machinery. Farwell made three or four trips to India and at least twice continued his voyage around the world. In the development of these plants in India as well as in the work of the parent company in America a considerable number of Technology men have found employment; this has been true also of the other business ventures in which Farwell Bemis engaged. In the Bemis Bro. Bag Company Farwell became chairman of the board of directors in 1925 and held this position until his retirement from the company in 1934. During the latter half of his lifetime he became deeply interested in the subject of housing in which he gained recognition as a national authority. Shortly after the War he established the Housing Company, the Atlantic Gypsum Products Company, and Bemis Industries, Inc., all having to do with improvement of the materials and methods of the housing industry. For a number of years he maintained a technical staff on research and experiment. He was the author of a notable three-volume book under the general title of "The Evolving House," the last volume of which he had completed just prior to his death. This bears the imprint of the Technology Press, M.I.T.

Few Alumni have shown such devotion and have given such service to Technology as did Farwell Bemis. His loyalty to the Institute was manifest throughout his undergraduate years when he was active in class matters and was class president in our senior year. This activity in Technology and class affairs continued ever after until his death. He was chairman of the alumni committee which developed the Civil Engineering Department's summer surveying camp at East Machias, Maine, toward the construction of which he was a liberal contributor. He was elected president of the M.I.T. Alumni Association in 1910 and since 1914 had served as a life member of the Corporation. In the latter capacity he served at various times and for many years on the visiting committees to a number of departments, among them, Civil Engineering, Architecture, Naval Architecture, and the Division of Industrial Coöperation and Research. He, probably more than any other man, was responsible for the development of Technology's dormitory system, beginning with the '93 dormitory which was the gift from the Class made at our 30th anniversary. While the Class at large contributed to this fund, this dormitory was the conception of Farwell Bemis and he personally contributed by far the greater portion of its cost.

In the National Association of Cotton Manufacturers, Bemis served for 15 or 20 years on the board of government and was president of that organization for two years during the War. As president

he was drawn into active War work of the advisory committee of the Council of National Defense, serving on its commissions on labor, cotton-goods buying, production engineering, and the cotton goods section. His War service included also: member, War Service Commission, National Council of American Cotton Manufacturers; chairman, executive committee, National Association of Bag Manufacturers; member, M.I.T. War Service Auxiliary. As a member of the commission on industrial inquiry of the National Civic Federation, he was sent to Europe in March, 1919, to investigate industrial conditions in England and France.

For years an active member of the National Industrial Conference Board, he served on its executive committee from 1928 to 1932, and again from 1934 until his death; he was also chairman of the advisory council on research of that organization.

A descendant of sturdy English stock who came to America some three centuries ago, Farwell Bemis was much interested in England, particularly that portion from which his ancestry sprang. He was a frequent visitor there, and on his trips usually contacted Rigby Wason of London. In 1932 he contributed \$65,500 to a fund for the restoration of Lincoln Cathedral and was present at Thanksgiving services which were also attended by the Duke and Duchess of York when the work of restoration was completed. He held a life governorship in the English Speaking Union of London, was a life member of the Royal Society of Arts, and a member of the Royal Economic Society.

He served as alderman of Newton for four years, 1911 to 1914, was a director of the Boston Chamber of Commerce from 1914 to 1915, a trustee of the Newton Y.M.C.A. since 1923, a trustee of the Cambridge School of Architecture and Landscape Architecture since 1927, chairman of trustees for real estate of the Boston Y.M.C.A. since 1935, and he was a life member of the Bostonian Society, the Ipswich Historical Society, the New England Historical Genealogical Society, and the Boston Athenaeum, and a member of the American Oriental Society and the National Association for Constitutional Government. He had been a director of the Boott Mills of Lowell from 1905 to 1934; of the Second National Bank of Boston from 1916 to 1926, and of the Federal Reserve Bank of Boston from 1928 to 1932. His club memberships included the Exchange, Engineers, University, Union, and Technology clubs of Boston. He was also a member of the American Society of Civil Engineers and the Theta Xi fraternity.

Farwell Bemis and Faith Gregg of Colorado were married, December 30, 1899. For many years their home had been at 40 Old Orchard Road, Chestnut Hill, Mass. He is survived by Mrs. Bemis and by seven children, Farwell Gregg Bemis of Brookline, Mass., Faith Bemis Meem of Santa Fe, N. M., Alan Cogswell Bemis of Wayland, Mass., Alice Bemis

1893 Continued

Thompson of New York City, Judson Bemis, John Richardson Bemis, and Marjorie Delight Bemis of Chestnut Hill.

Henry Adams Morss died at the Phillips House in Boston, May 6, after a short illness. He was born in Boston August 30, 1871, the son of Charles Anthony and Mary Elizabeth Wells Morss, and was a descendant of Anthony Morss who settled in Newbury, Mass., in 1635, and of the Wells family which settled in Wells, Maine, the same year. On the Monday following his graduation with the Class in electrical engineering, he went to work in the factory of Morss and Whyte in Cambridge, and thereafter until his death he led an active business career with that concern and with others which developed from it. These several companies engaged extensively in the manufacture of insulated wires and cables and electrical appliances, in which work his engineering training was soon put to practical use. In 1918 he became treasurer as well as a director of the Simplex Wire and Cable Company, the Simplex Wire and Cable Company of California, the Simplex Electric Heating Company, and the Morss and Whyte Company. He succeeded his brother Everett Morss '85 as president of the family's business concerns after the latter's death in December, 1933. At the time of his death he was also trustee of the Morss Real Estate Trust, vice-president and director of the Hub Wire Cloth and Wire Company, and director of Arthur D. Little, Inc.

Like Farwell Bemis, Henry Morss was among the most prominent and devoted Technology Alumni, and for nearly a quarter century he was closely identified with work of the Institute's governing body, the Corporation. Shortly after graduation he served two years as class president. He was long active in the work of the Alumni Council in which perhaps his most notable work was that on the alumni committee which formulated plans for the development of Course XV, Business and Engineering Administration, which Course is noteworthy for its training of engineers for executive management. He was president of the M.I.T. Alumni Association from 1918 to 1919.

Henry Morss was the first '93 man to be elected an alumni term member of the Technology Corporation, in which position he served from 1911 to 1916. He served again as term member from 1919 to 1924 and at the expiration of this second term he was elected a Corporation life member. When his brother, Everett, became treasurer of the Institute, Henry Morss was elected assistant treasurer. On January 23, 1934, following Everett Morss's death, Henry succeeded him as treasurer, from which position he resigned some months later.

In his service on the Corporation, Henry Morss not only served on special committees and visiting committees, but he was for some time a member of the important executive committee. The two brothers, Everett and Henry Morss, closely paralleled one another in their long years of devoted and useful service to their Alma Mater.

Always an enthusiastic yachtsman, Henry Morss during his lifetime was the owner of some 20 boats, many of which he had had specially designed and built. Among them is the *Paladin*, an 86-foot motor yacht of heavy, offshore-cruising type, launched in 1928, an unusually seaworthy and comfortable craft embodying his ideas gained from long years of yachting experience. Sailing, however, was his chief amusement and he participated in many yacht races including ocean races requiring experience in navigation and seamanship. In 1907 and again in 1909 he won the Bermuda race, in his class, in his schooner yacht, *Derisib*. Besides many trips to Europe, he and Mrs. Morss made an eight months' trip around the world in 1909. During the latter he chartered a yacht for a two weeks' cruise, 600 miles in extent, in the Inland Sea of Japan, which he described as "the most interesting cruise I have ever had." For years the Morss family has occupied its summer home at Marblehead Neck and here the Morss children have been trained to carry on the family tradition in yachting. In the summer of 1933 the two older sons, with five friends, sailed their schooner yacht, *Grenadier*, to England, a voyage of 21 days, to participate in the Fastnet Cup ocean race in which they took second place. Henry Morss was for many years an active member of the Eastern and Corinthian Yacht Clubs of Marblehead Harbor, serving as an officer and on committees of both clubs and as commodore of the Corinthian in 1906, 1907, and 1908. He was a member also of the New York Yacht Club.

In addition to business, Technology, and yachting, he found time for other educational and philanthropic activity. He was a trustee of Radcliffe College and a former president of the Boston Children's Friend Society. Long a member of Old South Church in Boston, he became treasurer of the Old South Society in 1920. Among his clubs were the Union, Exchange, Country, and Engineers, all of Boston. He was a member of the American Institution of Electrical Engineers and the American Society of Mechanical Engineers.

He married Miss Edith Sherman of Boston in 1909 and established their Boston home at 24 Charlesgate East at the corner of Commonwealth Avenue. He is survived by his widow; by three sons, Henry A. Jr., Sherman, and Wells Morss; by two daughters, Eleanor and Virginia; and by a brother, John Wells Morss of Boston. The funeral service in the Old South Church on May 8 was largely attended, the many members of the Class present being seated in a body.

Charles Nourse Cook, President of the Woonsocket Institution for Savings and prominent in banking circles of Rhode Island, was discovered on the morning of May 18 to have died in his sleep. He had been in ill health for two years but had been able to attend to his usual business duties until within three days of his death. He returned from Winter Park, Fla., in March after a six weeks' period of rest. A member of one of the oldest Rhode

Island families, he was born in Woonsocket, March 18, 1872, a son of the late Theodore M. and Mary Adelaide (Nourse) Cook. His father was, for years, cashier of the Producer's National Bank and treasurer of the Producers Savings Bank, part of the several banks absorbed by the Rhode Island Hospital Trust Company when it opened its Woonsocket office. Charles Cook was graduated with the Class in the Chemical Engineering Course and he studied also at the Lowell Textile School. In 1894 he entered the employ of the Silver Spring Bleaching Dyeing Company of Providence. He was with that concern nine years when the business was sold to the United States Finishing Company. He rose in rank with the latter until he became president. When this concern was sold also, he became manager of the Slatersville (Rhode Island) Finishing Company.

Twenty years after his graduation from Technology, Cook followed in his father's footsteps and entered the banking field, becoming treasurer of the Woonsocket Institution for Savings. He served in that position until 1928 when he was elected president to succeed Governor Aram J. Pothier. Banking remained his chief interest throughout the remainder of his lifetime. Besides serving as head of the Institution for Savings, he was a director of the Rhode Island Hospital Trust Company of Providence and chairman of the board of managers of the Woonsocket branch of that bank. He was one of the reorganizers of the American Wringer Company and a member of its board of directors since 1922. He was also a director of the Providence and Worcester Railroad Company and for many years was secretary of the Woonsocket Hospital Corporation. He was vice-president of the Mutual Savings Bank Association of Rhode Island and a member of the investment committee of Brown University. Golf was his principal amusement. His club connections included the Cumberland, Wannamoisett, and Brae Burn Country Clubs, Hope Club of Providence, Agawam Hunt Club, and the Providence Art Club. He was also affiliated with the Chamber of Commerce and the City Club of Woonsocket. In 1894 he married Miss Mary Crosby Alley of Lynn, Mass. She died three years ago. They had no children. The Cook home was at 188 Prospect Street, Woonsocket, where, on May 20, his funeral services were held. — FREDERIC H. FAY, *Secretary*, 44 School Street, Boston, Mass. GEORGE B. GLIDDEN, *Assistant Secretary*, 551 Tremont Street, Boston, Mass.

## 1894

The Secretary must apologize to the Class for not presenting any notes since the February number of *The Review*. It has been a case of unintentional neglect on his part due primarily to the fact that there have been a great many demands on his time outside of ordinary Institute affairs. As a member of the State Commission on the Revision of Laws and Practices of Public Health, and as a member of the new advisory committee to the



commissioner of health of Boston, time-consuming demands have been made, yet these are both positions which are of the character of public duty in which the Institute is able to render some service to the state and the city.

In addition to these activities the government has caused to be sent to the Institute for training a group of 15 public health workers sponsored by the Social Security Act but nominated by various state departments of public health. The courses for these men have been going on since about the first of March and continued through the month of June.

The Secretary has also been doing some speaking at different times and places: On the fifth of February he spoke on the "Technology of Food Products" at the meeting of the Boston Rotary Club; later he went with J. Rhyne Kilian, Jr., '26, to Waterbury, Conn., to speak to the joint meeting of the Hartford and New Haven Technology clubs. While at Waterbury, we were most hospitably entertained at the home of Darragh deLancey '90 and Mrs. deLancey. The latter and the Secretary had a grand opportunity to discuss and review the events of 42 years ago when, as seniors, we were approaching the graduation period. We also had an excellent opportunity to discuss and compare the interests and affairs of our children and exchanged notes on impending marriages which are to take place in both families. A day or two later the announcement of Miss deLancey's engagement was made public.

More recently the Secretary has addressed the New Hampshire Headmasters' Association, consisting of the headmasters of private schools. His topic was "The New Changes in the Methods of Admission to the Institute."

It is with great regret that I must announce the death of two members of the Class: Charles E. Gilpin, who was a special student for a short time, died on the fifth of April. No information as to his history since leaving the Institute is available. Clifton A. Howes, VI, died on February 6 after an illness of several months. Howes entered the Institute from the Cambridge English High School, and after graduation was employed in the inspection service of the Boston Board of Fire Underwriters. He made his professional work in this field and throughout his life was attached to some of the Boston boards of fire underwriters and examiners and became very proficient in his special field. As an avocation he was an ardent stamp collector and wrote rather voluminously on various matters of special interest to philatelists. He had been president of both the local and national organization of the stamp-collecting brotherhood and was a member of some of the foreign organizations. He was an excellent example of the individual who pursues his hobby with great intelligence and enjoyment and became a recognized expert in the stamp-collecting field. Howes had a very serious automobile accident about 15 months before his

death and was seriously handicapped as a result of it. Unfortunately, a second accident in which he was hit by a careless driver resulted very seriously, causing injuries which led to the infections which were the immediate cause of his death. He left an aged father, a wife, and two daughters, to whom the sympathy of the Class is extended.

It is not often that we have an opportunity to correct erroneous reports of the death of our members. However, about 12 years ago such a report was received with reference to Morris L. Johnston. Like the famous report of Mark Twain's death, which he called "grossly exaggerated," the report in regard to Johnston's demise seems also to have been premature. Information received by the Alumni Office shows that he is still active and is at present with Scott, MacLeish and Faulk at 134 South LaSalle Street, Chicago, Ill.

Joe Kimball, whose calling as a sanitary engineer is bound to take him to various parts of the country, is now located at 300 Linden Avenue, Knoxville, Tenn. The Secretary is under the impression that he is one of the engineers of the TVA, but if Joe feels that this is an aspersion on his character, he can give me the information and I will apologize in the next number. — A. F. Hunt, Jr., who has for many years made Nahant his home address is now residing at Philmont, N. Y. As usual Hunt maintains his natural reticence in regard to his professional activities. — C. N. Kinney is still holding down his job as professor at Drake University, Des Moines, Iowa. — F. A. Schiertz is very active in the testing and metallurgical details of the steel for the structures for the Golden Gate Bridge and Highway District, but instead of being in San Francisco, he is still located in Roebbling, N. J., where the steel is fabricated. — A new address for E. L. Andrews is 7728 South Cregier Avenue, Chicago, Ill.

A few weeks ago the Secretary received a very attractive postal from Peru which proved to be from Al Tenney, who, with his wife, was making a tour of South America. In addition to the interesting things which he saw there in the way of scenery, Tenney reports that on the register of the hotel where he was staying in Lima, the name of Mr. and Mrs. Raymond B. Price appeared, as they had been guests of the same hotel a few weeks earlier. The Secretary is hopeful that he may hear from Price with reference to his observations in South America within a short time, and he is also looking forward to having had a personal interview with Tenney at the Alumni Day dinner.

Although it is somewhat old, we direct attention to a reference in *Hoard's Dairyman* that at the 46th annual commencement of North Carolina State College of the University of North Carolina, a certificate of meritorious service in agriculture was awarded Leonard Tufts, owner and breeder of Ayrshire cattle at Pinehurst. This honor was conferred in recognition of his contribution to the dairy industry and for the part he played

in working out the herd-test plan. Tufts has been a very important factor in the improvement of agriculture and dairy conditions in North Carolina and is perhaps as responsible as any one for the good-roads movement in the state.

George Owen has taken a very prominent part in the development of the new dinghies which have opened up a very healthful and enjoyable form of sport to the students at the Institute. About 40 of these boats are now on the river and George has not only had much to do with their design, but he has also been extremely generous in time given to instruction in sailing. — Robert Spurr Weston has recently been a lecturer in public health engineering at the Institute, a service which he renders annually. Weston has for several months been extremely busy with engineering projects in water supply and sewage disposal for towns and cities which are receiving aid from the governmental agencies. It is an important public service for which the pay to the engineer is inadequate and frequently long delayed. — The cards were received a few months ago announcing the marriage of Walter V. Batson. Unfortunately the Secretary has not at hand the announcement so cannot give the former name of the present Mrs. Batson, but we can assure her that a large group of '94 friends are not only congratulating him, but equally congratulating her on the man of her choice. — SAMUEL C. Prescott, Secretary, Room 10-405, M.I.T., Cambridge, Mass.

#### 1896

At the time these notes are being written, about ten days before the class reunion, everything promises for a successful party, although in a few cases unexpected complications have arisen to disappoint men who had been very keen on coming to the reunion. Full report of the event will be given in the class news in the first issue of *The Review* in the fall.

Admiral R. E. Bakenhus has been selected by the M.I.T. Alumni Association for membership on the Departmental Visiting Committee for Mathematics. Incidentally he is interested in soil mechanics as chairman of the committee on bearing value of pile foundations of the waterway division of the American Society of Civil Engineers, and planned to attend the international conference on soil mechanics at Harvard University, the last week of June.

Al Cluett's youngest of four boys, being graduated from Williams College at the time of our reunion, prevented Al from going to Osterville, as he naturally wished to attend the graduating exercises. Cluett was elected last year a life trustee of Rensselaer Polytechnic Institute, and this means that the educational functions of June took quite a bit of Cluett's time. — Doc Gilman had failed to tell Mrs. Gilman about the reunion, with the consequence that she had invited a lot of people for a house party at the Gilman summer home in West Dennis from June 4 to 7, which

1896 Continued

conflicted with the reunion, and Doc did not feel that he could very well run out on his wife's guests.

Haseltine had to give up his plans for coming East to the reunion because of a western automobile tour with his two sons after school was over and he could not make a trip East along with the trip West. — Clark Holbrook had a bit of hard luck slipping on a small rug on a tile floor on March 20, which broke his left arm and fractured his shoulder. He was in the hospital a few weeks and then was moved home in Miami Beach with nurses constantly in attendance. On May 20 his arm was out of the cast and he was getting electrical treatments and massage daily to get his muscles reawakened. His plans were to return to Red Bank, N. J., early in June, but it was out of the question for him to get to the reunion.

Walter Leland at last accounts had bought a ticket East, but had an itinerary involving business stops *en route*, so that it was a question whether he would arrive in time for the reunion. — Lou Morse thought he had the dates clear for the reunion, but he got all tied up with business affairs, including the usual scheduled monthly meeting of his organization. As president of the American Society of Refrigerating Engineers much of his time has been taken up. He was in Chicago attending the Midwest Power Engineering Conference, where he was chairman of the session on mechanical refrigeration. He had two speaking engagements in June, one before the Refrigerating Machinery Association and the other before the Air Conditioning Manufacturers Association at their annual meeting in Hot Springs, Va. In the middle of June he was due to attend a meeting of the American Society of Refrigerating Engineers at Skytop, Pa. In addition he had various committee meetings in the interests of refrigeration and air conditioning which took up considerable time.

Ed Northup had the hard luck to be attacked by a severe digestive upset which, with a weak heart, created a situation just before the reunion that made it impossible for him to make the trip north from Florida. — Walter Stearns in order to be in good shape for the reunion spent a week about the middle of May at Hot Springs, Va. — Mike Sturm had the good luck to receive, on May 23, a job to be done at once which was the first bang-up job that he had had in five years. It had its bad-luck side, however, that it absolutely prevented Mike from getting to Osterville, a keen disappointment for him and for the Class. — Clem Tower spent a month in the spring roaming around in the Great Smokies down in Tennessee. — Tozier started off in May with Mrs. Tozier for their western trip and at the time of the reunion was scheduled to be in California.

Joe Stickney had to make a business trip down South during the spring and later on, in accordance with his annual custom, was due for a trip North, and he felt that he could not include a trip

East as well. — Johnny Rockwell, Fred Damon, and Joe Driscoll assembled at Pinehurst, N. C., in March. John spent only a short time, but Joe was there for a longer period. Fred Damon continued on to Florida from Pinehurst. It is understood that all this was for the main objective of golf. In May Rockwell had his regular yearly trip to Maine and reported a wonderful time, with excellent fishing — the best catches being a six-pound and a five-pound salmon. — Before Con Young and Mrs. Young came North to Cape Cod they made a trip around Florida and spent a few days at Boca Raton, where they had a nice visit with vonHolst and his wife. Von has a fine camping plant with 16 houses, well built, which are available for sale or for season rental. — Wayne reported that he had seen Billy Andrew in Cincinnati and Billy was enthusiastic about the reunion, but could not seem to arrange to attend. Wayne also met Guy Wall on the street one day in the spring, but could not get Wall headed East in June. Guy had just returned from a trip. — John Tilley's daughter, Gertrude, was graduated from Russell Sage College early in June, but fortunately the date did not conflict with the reunion. — Rutherford was able to attend the Diamond Jubilee Dinner of the Technology Club of New York on May 6, where Bakenhus, Coolidge, Hall, and Sturtevant were also present.

Louis Marble has turned up further information in regard to George Bowes. Bowes is living with his sister, Mrs. C. B. Adams, at 421 Locust Avenue, Zanesville, Ohio. George's daughter, Mrs. H. T. Krause, is near Cleveland, being at 1240 Manor Park, Lakewood, Ohio. She is a business woman, having the position of acting head of the publicity department in one of Cleveland's largest and most fashionable department stores. — Bert Spahr was in Boston on May 7 and the Secretary had the pleasure of lunching with him. He had just come back to his farm in North Egremont, having spent eight months in California, where his son is in school, and where Mrs. Spahr was going to remain until after graduation. — Billy Anderson was in Boston for a few days early in May, bringing Mrs. Anderson on to the Copley Plaza for a change and rest. Billy was able to get out for a golf game at the Oakley Country Club, followed by dinner, at which Rockwell, Joe Driscoll, Perl Underhill, and the Secretary were present. Later on the crowd adjourned to Joe Driscoll's house in Brookline to finish off the evening with contract. Billy refutes absolutely a previous statement in the class news that he had retired and says this last winter he put in two of the hardest months' work of his life.

To Bradley Stoughton has come the honor of being the first dean of engineering in Lehigh University, as a result of the recent action of the board of trustees, and following upon the steady growth of engineering at Lehigh over a period of years, which finally made it desirable to coordinate all the various engineering

departments under one head, and Bradley, as head of the department of metallurgy, was the logical man for the job. He was secretary of the American Institute of Mining and Metallurgical Engineers from 1913 to 1921. In 1922 he prepared an important report on hours in the steel industry. Before his A.I.M.E. secretaryship he had taught as adjunct professor of metallurgy at Columbia University under Henry M. Howe and had written his book on "Metallurgy of Iron and Steel." In 1922 he was elected president of the American Electrochemical Society. In 1923 he was called to Lehigh to take the chair of metallurgy and has been there ever since. Lehigh trustees have also reestablished the Ph.D. degree in metallurgy after a lapse of 42 years.

Faville of San Francisco, who is past president of the American Institute of Architects and whose firm designed many of San Francisco's finest buildings, talked in April before the M.I.T. Club of Northern California on "Fairies, Habits, and Art: Their Influence on Life." Having had some spare time in recent years, Faville has devoted himself to painting, largely in water colors, and his paintings which had been on exhibition at the University of Oregon were exhibited at the meeting of the M.I.T. Club when he spoke.

Rear Admiral Bakenhus with Mrs. Bakenhus has rated over a column in *The Villager*, which is the name of the Greenwich Village local paper. He has been given a very complete write-up under the heading "Who's Who in the Village." It mentioned that he had resided for three years at 51 Fifth Avenue and, after giving the highlights of his career, spoke of their daughter Dorinda, a Goucher College graduate, now doing social service work in Syracuse, and also told of Bakenhus's recent activity in fencing and in piano playing.

Jacobs was down in Washington during the spring recess of the University of Vermont. He is all wrapped up in seismic waves and has recently acquired a brand new vertical component for his seismograph. — Charlie Tucker has become a government man and since last December has been very busy acquiring land for the Massachusetts state forestry department. He is very enthusiastic over the work and believes state forests are a wonderful thing. He has already acquired about 1,500 acres of land in North Andover alone. As for his dairying and orcharding, he has an orchard of about 1,200 peach trees and 500 apple trees and a dairy of eight cows. It is not tremendously profitable work, but it is interesting and healthful and the prospects are splendid for a good apple and peach crop this year. All the members of the Class of '96 are invited to call on Tucker when the peaches are ripe. He says frankly, however, that he has not operated his cider mill for a number of years.

Sympathy goes out to our classmate Mrs. D. D. Addison of Brookline over the loss of her husband Dr. Addison on March 27. Dr. Addison was noted and



1896 Continued

honored as rector emeritus of All Saints Church in Brookline. — Ben Shepard is reported to have passed away on May 11. Further details will appear in the next issue.

Harry U. Hart, Vice-President and Chief Engineer of the Canadian Westinghouse Company, Ltd., died suddenly at Hamilton, Ont., on March 15. He came to M.I.T. from Marietta College and was with our Class for two years taking the professional work in Course VI. He was born June 26, 1874, at Covington, Ky., the son of H. U. and M. (Scott) Hart. He leaves a widow, Mrs. Louise B. Hart, and there were two daughters, Mary, born in 1906, who was graduated from Wellesley College in 1928, and Evelyn, born in 1911. Hart entered the employ of the Westinghouse Electric and Manufacturing Company in 1893 as a student apprentice, one of the coterie of brilliant young electrical engineers to whom George Westinghouse looked for the development of the products of his prolific, inventive mind. In 1899 he was appointed designing electrical engineer for the French Westinghouse Company, later being appointed chief engineer, and remaining for five years with that company. During that time he had charge of the installation of electrical equipment of large hydroelectrical developments in France and Italy. He was appointed chief engineer of the Canadian Westinghouse Company in 1905, one year after its organization, so that he grew up with the company, and had a prominent part in the planning and development of the large power projects. He became general manager and chief engineer in 1923, and vice-president and chief engineer in 1928. His associates speak of his kindly and gentle personality and his rare combination of leadership with ability to direct and to achieve. He was active in church work and had various club affiliations.

W. E. Spencer Deming, who died September 1, was with us from 1892 to 1894 and again in 1895 to 1896, as a student in electrical engineering. He was born November 19, 1872, in Boston, son of Edgar M. and M. Ellen (Poole) Deming. He was married September 12, 1898, to Fanny Emma Dodge and had two sons, Edgar D., born February 28, 1901, who was of the Class of 1923 at M.I.T., and Spencer F., born April 28, 1906. Deming's life and work have been around Boston in various business enterprises. For two years after graduation he was with the Roessle Brewery. He was proprietor of Cobb Hersey Company, 1908 to 1910, the Dearborn Grocery Company, 1910 to 1918, the Park Boulevard Garage, 1918 to 1920, and the Auto Storage Company, 1920 to 1923. More recently he has been with Hill and Hill and also a partner in the Lochdale Realty Company.

Harry Dyer, who died January 29, was with us three years in the architectural course and was a member of the Sigma Alpha Epsilon fraternity and the Architectural Society. He was art editor of the '96 *Technique*. He was born November 16, 1871, the son of Robertson and Amanda

L. (Waite) Dyer. He married Alice M. Jordan in 1901, who died in August 1908. His second wife, whom he married April 14, 1915, was Agnes Schasse. There are four children, John H., born January 16, 1908, Harry W., born January 28, 1917, Florence H., born September 4, 1919, and Agnes S., February 12, 1925. He was a special designer and colorist in architects' and interior decorators' offices from 1896 to 1908, and sales manager of the Van Kannel Revolving Door Company from 1908 on. He was director and treasurer of the Alfred Game and Toy Company and president of the H. W. Dyer Company. He made inventions on revolving doors, refrigerating devices, panic exit locks, calculating devices, automobile tires and bumpers, and toys. — CHARLES E. LOCKE, *Secretary*, Room 8-109, M.I.T., Cambridge, Mass. JOHN A. ROCKWELL, *Assistant Secretary*, 24 Garden Street, Cambridge, Mass.

## 1898

The following clipping from the Boston *Herald* of March 11 reminds us that one of our members who has not lately attended as many of our class gatherings as he should is still actively on his job: "Alfred W. Lombard yesterday started his 19th consecutive year as chairman of the board of health of Arlington. The board, as usual, completed its organization by choosing the health expert as its head. He was first elected a board member in 1917. Mr. Lombard, a resident of Arlington for 30 years, is assistant director of division of reclamation, soil survey, and fairs of the state department of agriculture. He was graduated from Waltham High School and M.I.T. . . . entering the service of the department soon after completing his technological course. Another of Mr. Lombard's activities is secretaryship of the Massachusetts Agricultural Fairs Association."

George Cottle returned a few weeks ago from another of his travels; this time he penetrated through the jungles of British Guiana, not to mention Venezuela, Trinidad, and so on. He took his camera, this time the new color movie kind, but the films have not been developed in time for showing this spring. We hope he will show them at a '98 Boston dinner meeting early next autumn.

We note a few new addresses, unaccompanied by any other news: Howard L. Bodwell, American Sheet and Tin Plate Company, Frick Building, Pittsburgh, Pa.; George R. Anthony, 4228 Sturtevant Avenue, Detroit, Mich.; Edward S. Wiard, 3200 South Acoma Street, Englewood, Colo.

We have the following death notices: George A. Hutchinson, 14 Wales Street, Dorchester, November 27; William D. Staples, American Telephone and Telegraph Company, 195 Broadway, New York City, February 2; Leslie C. Allen, Newport, R. I., November 22; Richard B. Van Horne, Montreal, who died in 1932; George Isaac Fiske, March 29.

Fiske was born in Roxbury, Mass., on November 28, 1875, and attended public school there and the Roxbury Latin

School, entering the M.I.T. in 1893 and was graduated with our Class from Course VI, Electrical Engineering. He belonged to the Phi Beta Epsilon fraternity. — He was of English ancestry, on both sides, who came to this country in the Seventeenth Century. His grandfather, David Anthony, was one of the pioneer cotton manufacturers in Fall River, Mass. — He leaves a wife (*nee* Annie B. Tearle) but had no children.

He was a man of high character, living up to the best ideals of a Christian gentleman, admired and respected by all who knew him. The following is quoted from a letter from the superintendent of production of the Christian Science Publishing Society: "George I. Fiske, at the time of his passing, March 29, was technical assistant to the manager of the Christian Science Publishing Society in Boston. Upon graduation . . . Mr. Fiske was employed for about 10 years with the American Machinery Company, manufacturers of textile machinery, as assistant to the works manager. He then affiliated himself as electrical engineer with the Choralcelo Company until 1917 when his services were sought by the Christian Science Publishing Society as plant engineer in charge of maintenance."

"Shortly before construction was begun on the present publishing house at 1 Norway Street in 1931, the many divisions of maintenance were reorganized and taken over by The First Church of Christ, Scientist, and Mr. Fiske became technical assistant for the Publishing Society. To an excellent technical training, he brought skill in the application of engineering principles which made him invaluable in any work turned over to him, from layouts of great detail for the new building to the solution of the many problems arising in connection with the publication of a large daily newspaper, and weekly, monthly, and quarterly periodicals. With his mechanical ability, George Fiske was blessed with a genial and harmonious nature which enabled him to put through his work without friction to those concerned. A man of the highest integrity, he was held in unusual esteem and love by his associates. — Besides his business interests, he was very active in the affairs of Second Church of Christ, Scientist, Boston, where he had served as Sunday school superintendent, treasurer, and director." — ARTHUR A. BLANCHARD, *Secretary*, Room 4-160, M.I.T., Cambridge, Mass.

## 1900

A recent mail brought in a copy of the 30-year book of the Class of 1905, with a full description of their reunion, June, 1935, at Old Lyme, Conn., and up-to-date histories of the classmates. It really is a fine book and we wish to thank the Secretary, Fred Goldthwait, for his thoughtfulness.

The sympathy of the Class is extended to Jim Patch in the death of his wife, Caroline M., who passed away, March 28, at her home in Stoneham. — It is with

1900 Continued

regret that we record the death of Howard R. Dunbar, II, who passed away on May 15 at his home in Canton.

Professor Locke sends in the following: J. H. Batcheller, consulting mining engineer of Corvallis, Ore., and head of the geology department at the Oregon State College, has been appointed to serve on the consulting staff of the mines division of the Oregon Board of Vocational Education, and will have an active interest in the Grants Pass Mining School. This school is being financed by WPA funds and is reported to have an enrollment of over 1,100. — C. BURTON COTTING, *Secretary*, 111 Devonshire Street, Boston, Mass.

## 1901

As these notes are being written our 35th reunion is still ahead, but when it occurs it will be too late to get an account of it in this number of *The Review*, so you will have to wait until fall to find out what happened, unless you were one of the fortunate ones who were able to attend.

P. A. Potter sent me the following clipping from the *Textile Bulletin* of March 5: "David Low died at his home in Asheville, N. C., following a brief illness. He is survived by his widow, one son, David Low, and his mother, Mrs. Louise T. Low of Gloucester, Mass. Mr. Low was resident engineer here during the construction of the American Enka plant. He was a native of Gloucester, Mass., but had lived in Asheville for the past three years. He was educated at Cushing Academy, Ashburnham, Mass., the M.I.T., and an engineering school in London, England. He also was connected with the construction of the Riverside and Dan Cotton Mills, at Danville, Va., the American Chattillon Company plant, Rome, Ga., and the Owens Glass Company, Toledo, Ohio."

In the last issue of *The Review* I mentioned the promotion of Albert F. Sulzer to the position of assistant general manager of the Eastman Kodak Company; I have just heard that Charles K. Flint was also promoted at the same time to be general manager of Kodak Park, succeeding Sulzer. The latter has been employed by Eastman Kodak Company since his graduation from Technology and has worked his way up from an assistant chemist to his last position as manager of the plant. He was elected a director of the company in 1931 and vice-president in 1934. Flint joined Kodak as construction engineer in the building of the Kodak office in State Street. For two years he was engineer in charge of construction at Toronto and for five years, superintendent of engineering and maintenance at Kodak Park.

Frederick G. Clapp returned to New York late in March after a three weeks' professional trip in Louisiana and is now on a field trip in the Middle West. — ROBERT L. WILLIAMS, *Secretary*, 109 Waban Hill Road North, Chestnut Hill, Mass.

## 1902

Normie Borden recently sent in a check for dues (the second received so far this year — Titcomb's came first) and signed

the card "Acting Administrative Officer, Vermont ECW, State House, Montpelier." Now, we are acquainted with sundry alphabetical combinations but the above was new to us so we wrote Normie for light on this point. From his reply we quote: "Of course, we all know what a puzzle these alphabetical combinations are, but when you've been part of a thing for three years you automatically suppose every one must be familiar with your own particular . . . hash."

"The ECW (Emergency Conservation Work) is the temporary organization under the United States Forest Service, which supervises and operates the work of the forest camps of the Civilian Conservation Corps. My particular job is attending to the administrative and property details in the central state office. We have jurisdiction over all the CCC forest camps in the state. I have been here for a little over a year. For two years before that I was in charge of the camp at Plymouth, Vt. (Calvin Coolidge State Forest), as camp superintendent."

"Those of us who have grown up with this work feel that it is the most worthwhile project ever undertaken by any government anywhere. It is still officially in the emergency class, but no work was ever more worthy of a permanent place in a national program and we hope that it will eventually be made a fixed thing. These are broad statements and perhaps sound too idealistic, but when you know of the hundreds of thousands of young men we have turned from potential trouble makers to honest, hard-working, loyal citizens, and of the millions of acres of forest land we have helped to conserve for future generations, to say nothing of the thousands of recreational developments we have made for people of our own time, then you cannot help but believe that no other nation has ever undertaken any work so entirely constructive or so completely worth while. Nor can you help but feel with us that this work is a vital necessity for the present and future of our country, which must be perpetuated."

"Regarding more personal matters, both my boys are grown up and married. The older one, Norman, Jr., is an Army flier stationed at Mitchel Field, Long Island. The younger, Barry, who was at our 25th reunion, was graduated from West Point but resigned from the Army and is now in private life in Woodstock, Vt., where he has opened a bookshop. The boys' mother died in 1933, and I married again last year, thereby adding two more children to my interests. We have our home at 367 Elm Street."

Harlen Chapman writes from Troy, N. Y.: "Since graduation I have spent practically all my time in the gas and coke business. I started in June, 1902, at Sydney, N. S., where I spent an interesting year and a half. While we felt that we were almost at the 'jumping-off-place,' yet there were some delightful episodes, one of which was when Admiral Peary stopped at Sydney on his way back after one of his early attempts to reach the North Pole."

"From Sydney I went to Sparrows Point, Md., arriving there shortly before the big Baltimore fire of 1904. After an eight years' sojourn, I went to Detroit where I remained for one year and then transferred to Indianapolis in the fall of 1913. From there I went to Terre Haute, Ind., in 1923, and in 1927 I came to Troy and am still with the same company (Hudson Valley Fuel Corporation) which has since become part of the Niagara Hudson system."

"My daughter, Mary, is married to a lawyer and lives in Washington, D. C. She has one son who is nearly five years old, and they spend a good part of each summer with us. My son, Harlen, Jr., was graduated last June, and is now with the Connecticut General Life Insurance Company at Hartford."

"So far I have not attended any of the class reunions, but I expect to be on hand when our 35th rolls around." Well now, there's a starter for 1937.

Dana Fisher has been living for some months at 92 Corey Street, West Roxbury, Mass., but we only recently found it out. This may go to show what a sober and discreet life Dana and the Secretary both lead. Dana's daughter, Nancy, has a position in New York that leaves her some time to take courses at Columbia. Dana's son, Robert, is in the local junior high.

Arthur Sawyer is now in Denver, his address being 520 United States National Bank Building. McKechnie has left there and is now with the Potash Company of America at Carlsbad, N. M. Charles Adrian Sawyer, as commodore of the Boston Yacht Club, will have charge of the annual cruise of that club in July. Another ardent yachtsman is Chandler Hovey who was a member of the Class for the first part of our course. He was head of the group that put the *Yankee* into competition for the defender for the America's Cup two years ago. He has recently purchased the *Weetamoo*, which is another former cup aspirant and is a splendid boat in the same class as the *Yankee*.

George P. O'Connell died a few months ago after a long and painful illness. O'Connell, after graduating in Course I, went to work on a dam and mill at Miller's Falls, Mass. Later he was with the commission on water supply for New York, and then with the Passaic Water Company at Paterson, N. J. For several years he was with the board of water supply of New York as assistant engineer on the Ashokan Reservoir. For over 20 years he had been a member of Daniel O'Connell's Sons Company, general contractors of Holyoke, Mass. George never married; he is survived by his brothers with whom he had been associated. — FREDERICK H. HUNTER, *Secretary*, Box 11, West Roxbury, Mass. BURTON G. PHILBRICK, *Assistant Secretary*, 246 Stuart Street, Boston, Mass.

## 1904

I apologize sincerely for failure to have any notes in the April issue, but at the time when copy was required by the



1904 Continued

Editors there was nothing in my folder. Such notes as I received came in within a few days after that time, and so I am presenting some things which may be a trifle ancient at the present date.

On February 28 an informal class dinner was held at the University Club, Boston, which was highly enjoyed by all present. The roster of the old faithful on that occasion was Comstock, Dennie, Fellows, Ferris, Moore, Munster, Parker, Russell, Sutton, Tompkins, and myself. Tentative plans were briefly discussed for the annual reunion in June, a full account of which will be published in the fall.

Under date of February 28 the following letter was received from Carle Hayward: "While in New York recently attending the annual meeting of the American Institute of Mining and Metallurgical Engineers, it was discovered that seven Course III, 1904 men were present, and we held an impromptu reunion. The men referred to are: Shorty Holbrook, Bob Faulkner, Bill Boggs, Guy Riddell, Ralph Williams, Hubert Merryweather, and myself. Holbrook is dean of engineering at the University of Pittsburgh. Faulkner and Merryweather are with the Bethlehem Steel Company. Boggs is superintendent of the big Noranda Copper Smelter in Quebec. Riddell is a consulting engineer in New York, who happens to be at the New York end of commuting to Russia. Williams is in the New York office of the Metal and Thermit Corporation, and I am helping to run affairs at M.I.T. We occasionally see other classmates at these meetings, but they did not happen to be present this year. Reports indicated that mining and metallurgy is slowly crawling out of the depression, and there was a general spirit of optimism at the meeting." — Under date of May 15 Professor Locke '96 sent me the following additional note: "Guy C. Riddell, consulting mining engineer, is engaged in professional work in Sinaloa, Mexico. He does not expect to return to New York City until June or July."

It is my sad duty to record the death of another well-known member of the old faithful guard: Herbert W. Goddard passed away on March 1, as recorded by the following clipping from the New York *Herald Tribune*: "Pelham, N. Y., March 2. Major Herbert Willard Goddard, Vice-President and Director of the Blagden Construction Corporation, New York City, died at Mount Vernon Hospital on Sunday after a three days' illness of pneumonia. His home was at 2 Parkway Drive. Major Goddard was commissioner of the Pelham Boy Scout District. A native of Lowell, Mass., he was the son of the late Charles Rutherford and Sarah Alice Jefferson Goddard. . . . In the World War he served as major with the ordnance department and later as major in the 360th Engineers, United States Army Reserve. Major Goddard was construction engineer for the Bethlehem Hotel, Bethlehem, Pa.; the Putnam Trust Company of Greenwich, Conn.; and the Stillman Rockefeller residence at Greenwich. Surviving are: his wife, Mrs.

Evangeline Fairchild Goddard; a son, Douglas Phipps Goddard; two brothers, Charles Rutherford Goddard of Washington and Alfred K. Goddard, Lowell, Mass. Major Goddard was a past vice-commander of Pelham Post 50 of the American Legion."

A letter received from Selby Haar, dated May 23, indicated that there are a few 1904 men in New York City who get together occasionally, as evidenced by his account of their participation at the Diamond Jubilee Dinner on May 6: "Prompted by Charlie Haynes, I send you a program and menu of the recent dinner of the New York Technology Club, at which I understand there were some 250 present. Nineteen hundred and four had a table well up in the front at which there were in the order of their seating: Magnuson, Mr. and Mrs. Sosman, Skowronski, Mr. and Mrs. Whitaker, Charlie Haynes, my sister, and myself. Charlie does not seem to have aged at all in the 30-odd years since we were at the Institute. The rest of us showed it more. A good time was had by all. I don't believe either 1903 or 1905 had a full table. I was very sorry that Billy Evans was not there because we depend on him for news. I have seen Ott Miller, Easterbrooks, and R. B. Williams occasionally. He is building a new mill. My own work stays the same. It looks, however, as if the end is not far off. There is an earnest attempt to consummate a unification of all the rapid transit local lines and if it succeeds there may be more subways to build."

This completes the notes which I have at hand, and in closing I extend to you all my best wishes for a pleasant summer and an enjoyable vacation.—HENRY W. STEVENS, *Secretary*, 12 Garrison Street, Chestnut Hill, Mass. AMASA M. HOLCOMBE, *Assistant Secretary*, 8 Rosemary Street, Chevy Chase, Md.

### 1905

Notice of the week-end reunion at Old Lyme, Conn., in celebration of our 31st anniversary brought a few news notes on the return postcard. Lloyd T. Buell, III, wrote from Bisbee, Ariz., of a proposed trip to Washington late in May. A slight bit of personal information was contained in the statement that his son, Tom, 17 years, would accompany him. Lovejoy, IX, in sending in his regrets, informed us that Carroll C. Curtis, IX, has returned to Boston from Portland, Maine, and is now located with Ellis and Company, 10 Post Office Square. Hallet R. Robbins, I, writing from Glendale, Calif., inferred that California would be a better place for reunions than Old Lyme and dared old pals to write him, or better still, look him up.

We learned through Carl Danforth, III, 200 miles away, that Bill Ball, Jr., '34, was to be married in June. Through Hub Kenway, II, we learned that a daughter of George C. Thomas, II, was recently married. Undoubtedly there is available a lot more news of the doings of 1905 men and their families. Class news gatherers all over the country please take notice. W. A. Taylor, I, could not reunite with the

Class this year as his second son, Ralph, was graduated from Duke on the same day. The same reason, plus several others, kept Harry Wentworth, VIII, away this time. His son, Vincent, was graduated from Dartmouth and Gordon, from Newton High. The oldest son, Nathan, was returning from Paris at about the same time to be married. On top of all this, Mrs. Wentworth had her 30th reunion at Smith. June looked like a busy month for Harry and we are forced to accept his excuse, provided graduations, marriages, and reunions do not again gang up on him in our sacred first week in June.

Harry reported a very interesting automobile trip through the South this past winter, including all the real watering places in Florida, Alabama, and Mississippi, with a side trip to Havana. He drove 4,400 miles plus the rides he "thumbed." There is no mention of contact with classmates, which from our viewpoint should have been his real objective. Francis E. Drake, II, forgot the coming reunion long enough to plan a trip starting June 1 through the Carolinas and Florida.

Our foreign commuter, Carl H. Graesser, II, left Boston on the S.S. *Bremen* on April 24 to enroll 1905 men in England for the 31st reunion. He was unable to contact Walter Bent, X, but publication of his arrival in the *Scotland Yard Journal* did bring a telephone call from Ralph Whitcomb, I, London representative of J. G. White and Company, Ltd. Carl said a 1905 reunion, held in London the following night with two attending "was all that it should have been, whatever that means. At least, he obtained the news that Ralph and Mrs. Whitcomb sailed for the United States on May 27, but as Ralph's daughters, Sally and Peggy, had dinner with your Secretary's family the Sunday before, this was simply verification of news already listed for this issue. Since Peggy Whitcomb will, in June, 1940, undoubtedly graduate from M.I.T. as the first class daughter-Alumna, Ralph should be here again to take in our 35th.

Al Prescott, II, attended commencement exercises at Marietta College during our reunion, as his son, Oliver, was graduated at that time and was Ivy Orator—probably he got the clinging-vine attitude from his Dad.

W. F. Becker, VI, regretfully told us of his inability to come East (from Chicago) this June and boasted about being a grandfather. (The grandfather data is coming in rather slowly.) — From Mrs. W. H. Keen, we learn that Bill, V, is again in a New York hospital with high blood pressure. Bill was apparently progressing very well until a kidney-stone attack a few weeks ago sent the blood pressure sky high and made the reunion this year impossible. Mrs. Bill grasped the idea of our week-end party very nicely when she sent Bill's regards to all and hoped all attending would find the "fountain of youth." — FRED W. GOLDTHWAIT, *Secretary*, 175 High Street, Boston, Mass. SIDNEY T. STRICKLAND, *Assistant Secretary*, 209 Washington Street, Boston, Mass.

## 1906

These notes are being written about two weeks before our 30th reunion. The inevitable correspondence in connection with the reunion has resulted in a number of items which will be of interest to the Class. Under the date of May 7, Burton Kendall, VIII, wrote with regard to the Technology dinner held in New York on May 6: "The 1906 representation at the Tech dinner in New York last night was not numerous. Only three of us and Mrs. Kendall were at the '06 table which filled up partially with graduates of later classes. The other two were Charlie Howard, II, and J. F. Fouhy, who, I believe, was originally '05 and took a five-year course, making his *début* with us." Kendall also advised that Charlie Howard's present address is Forest Hills Inn, Forest Hills, Long Island, N. Y.

Thanks are due to Bob Clark, XIII, for this letter from Oakland, Calif., dated April 22: "Instead of merely returning your questionnaire with the enclosed two bucks, I may as well take a chance of scaring you half out of your hide and add a line to let you know my pen hand is not totally atrophied. It is with very sincere regret that I must say that I shall be unable to attend the reunion, for I have most pleasant memories of the last one, at which the time I could be present was all too short. In fact, on that whole trip, in spite of the fact that it was seven weeks from the time we left home until our return, we never had nearly as much time as we wished at the places we most wanted to stop and visit. On that account we — Mrs. Clark and I — are quite determined that when and if we go East again, the schedule must be of our own making. In the last five years I have been variously occupied, part of the time at an almost total lack of anything but exercise, but the sheriff hasn't yet caught up with me, for which I am duly thankful. One of my periods of effort was devoted to the development of the 287,000-volt, 1,200-ampere switches for Boulder Dam, pictures of some of which were in a recent issue of *The Review*. That was a rather interesting bit of work, particularly as the switches were the largest ever made, in addition to being of particularly fine construction — far better than much of the usual run of such equipment. At present I am with a gold dredge manufacturing company in San Francisco, having a second experience in that sort of thing. Am very busy, and hope to continue that way for some time to come. Now, considering that there are several of our classmates who have seldom or never been in this part of the country, why wouldn't it be an idea to hold the next reunion in San Francisco? Those who have never been here would find the trip well worth while, and those who were making a second or third visit would at least be able to add our two magnificent new bridges to the sights they had seen. Think it over, or better still, come and look over the ground when the Exposition celebrating the completion of the

bridges is under way. You won't be sorry you came." Classmates will be interested in Bob's attempt to sell California to us for our next reunion.

More items from Professor Locke '96: Ray J. Barber is back again in Colombia, South America, among the black and partly black people of that country, descendants of the African slaves brought over by the Spaniards to work the alluvial mines of the coast. His stay will be for two months or more, and while he makes his headquarters in the city of Cali, his work is a combination of examination of quartz lode in Caldas and exploration for dredging lands on the Pacific coast. Incidentally Barber has been honored by the appointment as lecturer on placer mining on the faculty of Leland Stanford University at Palo Alto, Calif. — Guy H. Ruggles, mill superintendent of the Inspiration Consolidated Copper Company, spent several weeks in New York during December and January in connection with the design of a flotation plant for the Mountain City Copper Company in Salt Lake City, Utah, which is a subsidiary of the Anaconda Copper Mining Company.

It was with regret that the Secretary learned that neither of our Hawaiians would be able to make the 30th Reunion. It will be remembered that Bill Furer came to the 20th and Syd Carr to the 25th. The following letter from Syd Carr explains the situation: "Awfully sorry I can't make the reunion this year; I was talking to Bill Furer the other day and he has been obliged to cancel his plans for attending the reunion and his son's graduation from Annapolis, although I believe Mrs. Furer is going East for the graduation. I expect to be on the Pacific coast in the late fall, but shall not go East. Give my 'Aloha' to all the crowd and best wishes for a happy, joyful time."

While traveling through Laconia early in the month the Secretary ran into Walter Davol, VI. This was a coincidence, as a short time before a letter was received from him regarding his inability to attend the reunion. The letter read as follows: "I had made plans to attend the 30th anniversary of our Class, but unfortunately have had to abandon them, at least temporarily. For a number of years past now, I have tried to get time for a short European trip but, for one reason or another, have been compelled to postpone it. This year I have progressed to the point where it is quite likely I shall go unless the war clouds get a little thicker than they now are. As the itinerary calls for my absence at the time of the reunion, it is apparent that I won't be able to be with you. However, my superior, Malcolm G. Wight, one of our classmates and secretary of the company with which I am employed, tells me he is to be on hand, so that the insurance business will have a representative. From the foregoing, you may know that I am still in the fire insurance business in the capacity of field representative of the Hartford Fire Insurance Company. I have a wife and two children, my daughter graduating this year from college, and my son

anticipating to do likewise next year from Brown University. Most pleasantly do I remember the 20th anniversary at Old Lyme, Conn., and also many there, including Blackwell, Stew Coey, Keleher, Mrs. Eleanor Manning O'Connor, Wetterer, and many others. I will be very pleased if you will convey my greetings to all class members who happen to remember me, and you may be sure it is with a good deal of regret that I find myself unable to attend. . . . I hope to be with you instead at the 35th anniversary." John C. Frazee, now located in Pasadena, Calif., was sorry that he could not attend the reunion and hoped that we would have a splendid time, as did Major George Hobson from Schuylkill Arsenal, Philadelphia, Pa., where his duties confined him too closely. Charlie Mowry, II, who is with the Associated Factory Mutual Fire Insurance Companies, was prevented from attending by a trip to the Pacific coast. Jack Norton's absence was due to the fact that the Upjohn Company in Kalamazoo, with whom he is associated, was moving into a new factory. Ralph Patch, XI, was kept away by the annual meeting of the American Pharmaceutical Manufacturers Association.

John A. Root, III, who bears the title Captain and is retired from the United States Army, wanted to join us and sent best wishes, but was prevented from coming by poor health. He hopes to attend our next. — H. S. Whiting, VI, has not been well since November and although he is much better now, he could not make the reunion. — Percy Tillson, VI, sent best regards from Harrisburg, Pa.

Under the present schedule our publication of the October issue of *The Review* will be omitted. Therefore, readers will have to be patient until November to get the full account of our 30th reunion at Oyster Harbors. — JAMES W. KIDDER, Secretary, Room 801, 50 Oliver Street, Boston, Mass. EDWARD B. ROWE, Assistant Secretary, 11 Cushing Road, Wellesley Hills, Mass.

## 1907

June, 1937, our 30th reunion seems a long time in the future right now, but, at any rate, the dates June 5, 6, and 7 are reserved for us at the Oyster Harbors Club, Osterville, Mass., so you can now mark these on your calendar with red ink in a large circle as dates when you will want to be at the delightful location where our 25th reunion was held in 1932.

Sam Coupal, who is now making his headquarters in Phoenix, Ariz., is reported to be carrying on developments at the Tip Top Mine (silver) near that city. — Byron P. Luce is with Guantanamo Sugar Company, Guantanamo, Oriente Province, Cuba. — H. J. C. MacDonald's address, according to the Alumni office, is Hurlbutt Road, Wilton, Conn. We do not know anything of his work or activities.

According to the Boston *Herald* of May 4, William G. Perry of our Class was one of four Boston architects to be honored by the American Institute of Architects. Perry's firm, Perry, Shaw and



1907 Continued

Hepburn, was awarded testimonial of honor for work in recreating colonial Williamsburg, the citation being "for their skillful and scholarly design in recreating the architecture of this enduring national monument." Perry himself was advanced to fellowship in the American Institute, his citation being: "Highest honors in scholarship, honorable recognition in professional training, patriotic national service. An appreciation of beauty in form and proportion amply fitting him for eminence in professional work added to thorough study of precedent and historical research have combined to entitle him to advancement."

Ed Lee courteously sent us a copy of *Contact* for April, 1936, a publication of the New England Power Association. This particular issue was a souvenir of the great flood of 1936 in New England and in 31 pages of magazine size describes many scenes and events of the disastrous flood which began on March 18. An article entitled "Seeing Flood from the Air" written by Ed himself tells of his experiences while flying over parts of New England.

Parker Dodge, 1341 G Street, Northwest, Washington, D. C., writes that his oldest boy hopes to enter Williams in the fall and that his next oldest child, a girl, wants to be a coed at Technology the following year. "God knows why!" writes Parker. — Walter Kirby, New Canaan, Conn., says that he is very busy for the first time in five years. He is an architect and has several new houses to design and supervise. — Carl Bragdon, 290 Riverside Drive, New York City, is now in the research laboratories of International Printing Ink Corporation, helping to develop new kinds of ink.

Hermann Mahr wrote us in May that he planned to leave early in June to attend the International Chemical Engineering Congress in London. Hermann is with the duPont people in Wilmington, Del. — Joe Frank wrote that he could not attend the Technology Alumni Day on June 8, but expects to be on hand for our 30th next year. He says there is nothing new about himself "except that he is getting fatter and grayer." He and Sam Marx and Stud Leavell still have frequent reunions. — BRYANT NICHOLS, *Secretary*, 126 Charles Street, Auburndale, Mass. HAROLD S. WILSON, *Assistant Secretary*, Commonwealth Shoe and Leather Company, Whitman, Mass.

## 1908

L. E. Wemple, President of the Illinois Zinc Company, had occasion to visit the mining properties of his company in New Mexico last fall, and he concluded his visit with a hunting trip in the Black Range area of that state. He was successful in bagging a 300-pound black bear and a 10-point black tailed buck. — J. Worth Maxwell, who is assistant general manager of the smelting and refining division of the American Smelting and Refining Company, and who has been stationed in Mexico City for a considerable period, is now located in the city of Chihuahua,

directing the operations of the smelter at Santa Eulalia. — Lynn S. Goodman, formerly head of the statistical bureau of the Edison Electric Illuminating Company of Boston, has recently been elected clerk and assistant treasurer of the company.

With regret we report the death of Major John H. Caton, 3d, which occurred on May 2.

We have the following changes of address to report: Rodney C. Caryl, Corner Sweet Shop, 801 Cherry Street, Southeast, Grand Rapids, Mich.; Elliott S. Church, 3931 Franklin Avenue, Los Angeles, Calif.; Mrs. Ruth M. Denny (formerly Mrs. Ruth M. Barnes), Leadore, Idaho; Harold C. Faxon, Borneo Company, Singapore; William F. Grimes, 46 Anderson Street, Hackensack, N. J.; William C. Kerr, 2042 Mount Vernon Street, Philadelphia, Pa.; Charles C. Kinsman, University Draft Gear Attachment Company, 332 South Michigan Avenue, Chicago, Ill.; William E. Mahoney, care of F. J. Mahoney, Post Office Box 124, Hopkinton, Mass.; Ralph E. Manning, 800 Commercial Trust Building, Philadelphia, Pa.; J. Worth Maxwell, Apartado 63 Bis, Chihuahua, Chihuahua, Mexico; Arthur F. Mohan, Jefferson Davis Hotel, Montgomery, Ala.; Thomas B. Owings, 3322 P Street, Northwest, Washington, D. C.; Francisco D. Reyes, Bureau of Science, Manila, P. I.; George W. Scott, 315 Riverside Drive, New York, N. Y.; Harry P. Sweeney, 1729 21st Street, Northwest, Washington, D. C.; Professor Aram Torossian, 1800 San Lorenzo Avenue, Berkeley, Calif.; Ernest J. H. Waters, "Alderley," Broadway, Walsall, England; Richard W. Wilson, 1311 Beach Avenue, Vancouver, B. C. — H. LESTON CARTER, *Secretary*, 185 Franklin Street, Boston, Mass.

## 1909

With this issue another year comes to a close. Looking back over the year, the Class may well be proud of its record. A good start has been made toward the Class of 1909 Scholarship Fund, the total for which, including cash contributions, insurance policies already assigned to the Institute, and promised bequests by will, amounts to a little over \$35,000. The plan has had the almost unanimous approval of the members of the Class, and many, who because of present circumstances have as yet been unable to contribute, will undoubtedly do so later.

During the past year the achievements of a number of the Class have been recognized in one way or another, and we congratulate our fellow classmates on the honors bestowed upon them. This month we record the receipt by Mayo D. Hersey of the Louis Edward Levy Medal, awarded by the Franklin Institute of Philadelphia at special exercises on May 20. — Your Secretary is pleased to announce that at the annual meeting of the Boston Society of Civil Engineers last March, he was elected treasurer of the Society for the coming year.

This seems to be a travel number: Chet Pope has been to Mexico, and Carl Gram has been spending some time in London, where he is supervising work which E. B. Badger and Sons Company are doing in Persia. This spring Mrs. Gram and their daughter, Gloria, sailed for England to join Carl in London. — At the time of writing these notes, your Secretary is far from his accustomed haunts, and is located in Danville, Va., where he expects to spend a few months in connection with a hydroelectric development his organization is undertaking for the city of Danville. The trip down to the Old Dominion State was made by automobile, through the beautiful Shenandoah Valley and over the new Skyline Drive on the top of the Blue Ridge Mountains. The scenery is truly marvelous and well worth the added mileage.

Nine "Ought Niners" attended the Technology Club dinner at the Waldorf-Astoria Hotel, New York City, on May 6. "Inspired by the brilliance of the occasion and aided possibly by some of Oscar's excellent cocktails" — so Paul Wiswall writes — somebody undertook to send a special greeting to your humble Secretary, but being in Virginia, he did not receive the telegram until too late to reply, but he appreciates the thought.

My respects to you all, and may you enjoy a happy and profitable summer! — CHARLES R. MAIN, *Secretary*, 201 Devonshire Street, Boston, Mass. *Assistant Secretaries*: PAUL M. WISWALL, MAURICE R. SCHARFF, New York; GEORGE E. WAL-LIS, Chicago.

## 1910

Your Secretary is sorry to hear that William H. Horton passed away on February 9; the following was issued in the Edison Electric Institute *Bulletin* of February: "William H. Horton, sales promotion manager, West Penn Power Company, Pittsburgh, died February 9, in Elizabeth Steel Magee Hospital after a brief illness. Mr. Horton had been exceedingly active in state and national association endeavors and was a recognized authority on many technical subjects. His work on committees of the Edison Electric Institute has been of particular value to the industry.

"He was born in Delavan, Wis., and was graduated from the M.I.T. . . . in electrical engineering. Previous to his employment with West Penn, he had been with the Telluride Power Company in Utah, General Electric Company at Denver, Electric Bond and Share Company in New York, and in the United States Army Service. After a year as assistant to the vice-president at West Penn Power Company, Mr. Horton was appointed distribution manager in 1921, assistant commercial manager in 1926, and in 1928 was appointed to the managership of the sales promotion department.

"Mr. Horton resided at Brookside Farms, South Hills, Pittsburgh, and is survived by his wife, Elsie Connell Horton, and his 14-year-old son, William Henry Horton."

C. E. Locke '96, Alumni Secretary, sent in a notation to your Secretary that at a meeting of the New Bedford Alumni on March 10 he met H. N. Crichton, who is United States engineer for the enlargement of the Cape Cod Canal. His office is at Buzzards Bay, and he will welcome a call from all classmates who come that way.

Van Court Warren is making his headquarters at Auburn, Calif., and is now in charge of operations at the Yellow Jacket Gold Mine, Downieville, Calif. It is reported that the work is being carried on in a 700-foot tunnel where prospects are good.

The following notice is from the Boston *Herald*, April 20: "The Rev. and Mrs. Frank H. Palmer of Springfield have announced the engagement of their daughter, Mrs. Gladys Palmer Thyng of Wollaston, to Major Leroy Edmund Briggs of Providence, R. I. Mrs. Thyng was graduated from Smith College in 1912 and for several years was head of the economics department at the High School of Commerce in Springfield. Major Briggs is a graduate of the M.I.T."

In a letter from Dud Clapp he sends the following clipping from the Boston *Herald* of May 9: "A Hand a Day (contract bridge column). Today's hand is a contribution from Jerome Scheuer who ran across it at the Grand National in New York last month." Evidently Scheuer has given up tennis for bridge! — Dud mentions in his letter that he ran across an article in the magazine of the Monsanto Chemical Company that Dick Fernandez had won a prize for photography.

Arnold Davies is still in Cambridge, selling Blackmer pumps. — Your Secretary met J. W. Cilley and G. L. Mylchreest at Technology's Open House, the early part of May. Both classmates have sons attending the Institute at this time. — HERBERT S. CLEVERDON, *Secretary*, 46 Cornhill, Boston, Mass.

## 1911

May is merrily mellowing in its closing days and our Silvery Anniversary impends. When these notes appear, our gala Plymouth reunion will be history with details to follow. At this writing the man who is making a good bid for the distinction of traveling the longest distance is Paul Cushman, VI. He and Mrs. Cushman plan to motor on from Valparaiso, Ind., where Paul is on the faculty of Valparaiso University.

Your Secretary went over to New York May 6 for the M.I.T. Diamond Jubilee Dinner at the Waldorf-Astoria, where Gerard Swope '95 was toastmaster for a well-attended and highly successful affair. There were nine other classmates present, two of them with their wives: Nat and Mrs. Seeley, W. J. and Mrs. Seligman, Liv Ferris, Bill Martin, Bob Morse, Dick Ranger, Don Stevens, Walter Welch, and Heinie Zimmerman. Don Stevens, recently made a director of the Paterson (N. J.) National Bank, did a peach of a job awakening interest in our Silver Reunion.

Ray Lord, VI, thoughtfully sent a clipping from "These Plantations," a daily column of the Providence *Journal*, which paid fine tribute to Burleigh Cheney, II, WPA administrator for Rhode Island. Columnist J. Earl Clauson describes Burleigh as "tallish, fortyish, with brown hair, a red mustache, and an inexhaustible supply of nervous energy." Continuing: "He's so amazingly high voltage, in fact, that you wonder why he doesn't blow a fuse, but he just doesn't. Human difficulties interest him. It was his welfare work at the state prison which led Harry L. Hopkins to pick him as WPA administrator. He is a director of the Providence Floating Hospital Association and we don't know what else, a Rhode Islander of eight years standing, before that Phillips Exeter, Boston Tech, in the building supply business, organizer of the Cranston Chamber of Commerce, on the board of the New England Council, and electric and engaging no end. You might get the idea we like him; so do the other reporters for they all knock him now and then for his own good." Same old Burleigh!

Had a most interesting letter from J. O. Greenan, III, Vice-President, Marsman and Company, Inc., Paracale, Camarines Norte, P. I. He says: "After six years in the Islands I have at last rated a six months' vacation and I am sailing for New York via Europe with Mrs. Greenan and our three children, arriving on the S.S. *Vulcania* at Boston, April 29, and New York, April 30. We plan to spend a few weeks in the East and then drive to California, there settling in Carmel for the present at least. The arrangement is that Mrs. Greenan will remain there with the children, Maevie (11), Jimmy (nine), and Owen (seven), while I return to the Islands for an indefinite stay. I came over here in 1930 as general superintendent of Benguet Consolidated Mining Company and in 1933 joined Marsman and Company, Inc., as vice-president and manager of the southern division, embracing three plants: one with a 250-ton flotation mill, one with a 150-ton flotation mill, and a placer organization operating two dredges with a capacity of about 10,000 cubic yards daily. The work has been tremendously interesting but I am badly in need of a vacation and have looked toward it with great anticipation. . . ."

Three 1911 children, all of them honor graduates of Medford High in 1935, are continuing their fine work in college: Barbara Comstock at Radcliffe, George Cushman at Tufts, and Jack Herlihy '39 at M.I.T. Modest Daddie Herlihy asks: "I wonder if they take after their mothers?" — Ban Hill, I, who last July was appointed vice-president of the Baltimore (Maryland) Transit Company, was made president of the company this spring. Congratulations, Ban!

Charlie McManus, I, went on a Vagabond Cruise to Colombia, South America, in March. "We stopped two days at Havana — a great place for a total abstainer — on our way down," he writes, "and then took a long sail across the

Caribbean Sea to Santa Marta, Colombia. The first officer called me one morning at 3:30 to see the Southern Cross. — Visited Simon Bolivar's home in Santa Marta, also went up one of the mountains. Went through some of the jungles where the United States explorer, Gregory Mason, has discovered the remains of the ancient city of Tayro or Mongay, mentioned in Spanish history."

Ted Van Tassel, X, advises that Oliver Powell, XI, has not been with Robinson-Bynon Shoe Company in Auburn, N. Y., for years, having changed to the Marshall, Meadows and Stewart Shoe Company in the same city several years ago. — Sam Schmidt, VII, editor of *Every Friday*, a mirror of Jewish life and Jewish activities published weekly in Cincinnati, Ohio, hoped to get to Tech Night at the Pops on June 8. — Ralph Runels, I, has written, confirming his appointment as superintendent of the Lowell (Massachusetts) Water Department. — Frank Smith, III, wrote from Waterbury, regretting his inability to be at the reunion because his oldest daughter was graduated from Skidmore at the same time.

Did you notice the very attractive cover on the April issue of The Review from a photograph "Translucence"? It was Bill West, II, who took the picture. Before reunion Bill wrote from Chicago, where he is with Great Lakes Forge Company: "I am afraid you will have to worry along without me at the Silver Anniversary. What with sons at Tech and Northwestern and a daughter at Rockford College, I am letting them take care of the family's collegiate activities while I stay home and dig up the tuition."

From the Alumni Office we learn: Gordon G. Brooks, VIII, died at Atlanta, Ill., March 9, 1933; Staf Francis, IV, is at Hotel Dearborn, Dearborn, Mich.; Thede Polhemus, XI, has returned again to St. Louis from his Newton Centre parental home and is now at 2109 South Grand Avenue in the Mound City; J. A. Proctor, formerly of Lexington, Mass., is now with General Electric Company, Bridgeport, Conn.; Osborne Shenstone, I, formerly general superintendent of Massey Harris Company, Ltd., in Toronto, Canada, is now in charge of the company's American plant at Racine, Wis.

In closing this, the 25th volume of 1911 notes for The Review, may I express my extreme pleasure in having the opportunity of serving the Class, my appreciation of the coöperation of many classmates, and — please pardon this — my personal pride in never having missed an issue in which class notes appeared during the 25 years. Now for the next 25 years! — ORVILLE B. DENISON, *Secretary*, Hotel Bancroft, Worcester, Mass. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford, Mass.

## 1912

The alumni dinner in New York on May 6 at the Waldorf-Astoria was attended by the following classmates and guests: David Dasso, II, with Marti-



1912 Continued

nez'20 from Chile; H. E. Dexter, VI, with Mrs. Dexter; C. L. Gabriel, X, with Mrs. Gabriel; Page Golsan, VI, with Mrs. Golsan; J. H. Lenaerts, VI; C. E. Morrow, IV, with Mrs. Morrow; E. Nicholson, I; E. H. Schell, II, with J. R. Macomber '97 and C. B. Vaughan, II. Your Assistant Secretary regrets that he was unable to be there, but he received these names of the members who attended from Page Golsan, who also reported that they had a very happy time. Some discussion took place about the 35th reunion in 1937, and there is every evidence that a lot of classmates are looking forward to it eagerly.

We had a phone call from Jesse Hakes, I, on one of his recent visits to New York and he wishes to call attention to the fact that his address is Baltimore Tool Works, 1110 Race Street, Baltimore, Md., instead of Grant Street, as printed in the recent list of names and addresses sent to you. — David Dasso just returned from an extended trip to South America in the interests of Sulzer Brothers, Ltd., whom he represents. We have written him, asking for further details. — FREDERICK J. SHEPARD, JR., *Secretary*, 125 Walnut Street, Watertown, Mass. DAVID J. McGRATH, *Assistant Secretary*, McGraw-Hill Publishing Company, Inc., 330 West 42d Street, New York, N. Y.

## 1913

An interesting bit of news came to hand from Mexico: Edmund G. Brown of Malden, Mass., is now in the employ of the Santa Maria de la Pazy Anexas Mining Company at Matehuala, San Luis Potosí, Mexico. Mr. Brown is the metallurgical engineer in charge of the erection of a 300-ton-per-day cyanide plant. He expects to be in Matehuala for the next two years.

A rather pleasant surprise was had during the annual Open House of the Institute. While strolling through the corridors we ran into Fred Murdock, erstwhile Secretary of the Class. Murdock is back in New England, operating a business in Pawtucket, R. I. It is more than probable that he will have the mantle of secretary thrust back upon his shoulders by autumn. — William A. Bottomley has moved from Waterbury, Conn., to Hartford. — P. Donald Horgan is now living in Chicago. — Walter R. Bylund has moved from New York City to Woodmont, Conn. — Jacksonville, Fla., is now the home of Henry W. Dew.

Jim Russell was in the office the other day, looking just the same as usual, although complaining like everyone else about certain phases of business. Jim is no longer chairman of the school committee in Milton, and also having completed his tour of duty in lodge work, says he feels rather lost, owing to so much free time on his hands. — We had an interchange of correspondence with Bill Brewster during the last week, and also a telephone call from Charlie Thompson. — A pleasant and prosperous summer to all classmates! — ARTHUR L. TOWNSEND, *Secretary*, Room 3-435, M.I.T., Cambridge, Mass.

## 1914

It is with exceeding regret that there is here recorded the death on last September 27 of Martin J. Glennon. While Glennon stayed only a short time at the Institute, he had from time to time identified himself with class affairs. He attended our 20th reunion two years ago. At the time of his death he was employed by the Post Office Department at Boston.

It was very pleasing to note that at the New York Diamond Jubilee dinner on May 6, '14 had as many, if not more, in attendance than any other Class, thus keeping up our already splendid record of attendance at Technology affairs. Those attending with their wives were Herman Affel, Ross Dickson, Tom Duffield, Charlie Fiske, Seymour Spitz, and Louis Wilson; alone, Dinny Chatfield, Art Peaslee, Ben Rauber, and Commander Richey. At our tables also were Mesdames Rice and Taylor of 1913.

Besides being down in New York on May 6 for the dinner, Dinny Chatfield was at Cambridge on May 12 to deliver a talk on "Trends in Aircraft Design" before the New England Section of the Society of Automotive Engineers. Dean Fales and your Secretary attended just to see that Dinny did not fall into bad hands, but instead Dinny rather kept us on the defensive, at least during his talk.

It was indeed a surprise and pleasure at the April Alumni Council meeting to find there as the guest of Professor Schell '12, Werner T. Schaurte of Neuss, Rhineland. Although Schaurte has maintained contact with class affairs since Institute days, it is the first time that he has been back to the Institute since he was a student. As Mackenzie, Hamilton, Crocker, Wilkins, Corney, and your Secretary were present at this Council meeting, we held an informal reception for Schaurte. Schaurte was in this country on a trip in connection with his machinery business.

The papers throughout the country carried items early in April on Don Douglas, President of the Douglas Aircraft Company. Douglas, his two sons, and three male guests started on a cruise in his 90-foot, 40-ton auxiliary schooner *Kinkajou* and were caught in a severe gale. The yacht dragged its anchor and sank on a rocky reef in Pelican Bay about 100 miles out of Los Angeles. The party put ashore in a life boat with provisions and remained stranded for three days on uninhabited Santa Cruz Island until rescued by a passing fishing boat.

Classmates with the Bell System still continue to be the recipients of patent grants. A recent Washington list showed one each granted to Affel, Wentz, and Harrison. — The American Standards Association have recently adopted as part of their code the recommendations of the committee on automobile safety glass, of which committee A. W. Devine, assistant registrar of motor vehicles in Massachusetts, is chairman.

Commander Bob MacCart has been assigned to the Naval Aircraft Factory at the Philadelphia Navy Yard, but writes from the Naval Bureau of Aero-

nautics in Washington that, although he has been expecting to get to his Philadelphia assignment for about a year, the design work in Washington has kept him firmly attached there. — HAROLD B. RICHMOND, *Secretary*, 30 State Street, Cambridge, Mass. CHARLES P. FISKE, *Assistant Secretary*, 1775 Broadway, New York, N. Y.

## 1915

My error. I am sorry. The Boston class dinner was held at the Walker Memorial at the Institute and not at the Webber Memorial as reported in the notes in the May Review. — Apparently families read our notes, too, and I am glad to see that this interest arouses some pride and competition, evidence of which is a note from Mrs. Robert A. Schmucker, 545 Union Street, Hudson, N. Y.: "Bob, my son (Robert A. Schmucker, Jr., '39) is evidently the first class child to enter the Institute. He is living at the Phi Kappa Sigma house and seems to be enjoying life at the Institute. We hope he will survive the finals this month. As Bob is not much of a letter writer I thought I should let you know this." So, honors for the first class baby in Technology go to young Bob Schmucker and our best wishes for success to him.

Imagine the surprise of the following letter from Frank Scully (April 7): "A week ago today, March 31, I was in Los Angeles and had dinner with Dave Hughes, VI, Ray Stringfield, X, Elwin P. Norberg, IV, William Mellema, IV, and Kenneth D. Kahn, X. I flew from Boston on Saturday and arrived in Los Angeles Sunday night. Ray Stringfield volunteered to get the gang together and we had a very enjoyable luncheon at the University Club. The whole group was very anxious to be remembered to all their friends as none of them had been back to the Institute for many years. Brute Crowell was unable to come along, and Arthur Ball did not come down, though I spent Monday night with him at his home. I passed Jimmy James on the street but I was in a taxicab and did not have a chance to yell to him. . . ." Frank certainly showed his class loyalty and spirit by getting the boys together out there on the Coast and I am sure it must have been a pleasant reunion.

It's never too late, and so on: Our heartiest congratulations to Boots and Mrs. Malone for their new baby. I can still see Boots coaxing dollar bills away with the magic words he used on those dice at Saybrook last summer. From Boots: "Ever since last June I have been looking forward to two things, first for you to stop off at Stamford and say, 'Hello'; the other, the history of the Class that you were going to get out. Possibly I should not mention the latter as I imagine you have been pretty busy if you are like most of us. I have not written in reply to your various requests for news as I had nothing worth talking about. Now I have a grand piece of news: another daughter, born March 16 — just missed being an Irishman by a half hour. — I have begun to look for-

1915 Continued

ward to the 30th reunion and wonder if there isn't something that can be done so that it would be possible to have an intermediate affair. I do not want the 'dice' to cool off."

Herb Anderson in Philadelphia (Andy Anderson Number 2) does not let me forget his class interest. He sent me an attractive set of those gayly knitted glass jackets, so all I need now is something to use with them. Here's his usual cheerful note: "... This morning I was very strongly reminded of old memories because we had the pleasure of shipping a nice assortment of Hi-Jacs, Lo-Jacs, and Shaker-Jacs to the glassware department of Jordan Marsh's. Just so that you may know what this is all about, I am sending you, with my best wishes, a folder of Hi-Jacs in the service coaster packing for your immediate use. ... On occasion, I have the pleasure of seeing genial Ed Whiting, and my only regret is that I see him so seldom, even though he deals in electric motors which we sometimes use."

On page 16 of the May 18 issue of *Advertising Age* is a picture and big write up of Art Nelson, VI. This describes a typical day's work of this busy consulting engineer, and it shows Art to be a big man in the industry.

Echo of last year's reunion is the following good letter from Paul Connor at the Enfield Tennis Club, Enfield, Conn.: "... The reunion certainly was great. Life should contain a larger proportion of such good things as college days and reunions. During the past 20 years I have frequently thought of writing to the Class Secretary because I enjoy reading your notes in *The Review* and think every member of the Class is, in a way, under an obligation to report occasionally. I have found writing about myself very distasteful and that is why you have not heard from me. About 15 years ago I decided that an office was not my ideal of the place to spend one's life. At that time I was an estimator for the Bethlehem Shipbuilding Corporation, but was not faced with the necessity of earning a living. I gave up the job and have not held another since. For about three years I was engaged in farming, and that was enough of that, although I still grow and sell some asparagus as a sort of pastime or from force of habit, I don't know which. For about another three years I was in the concrete-block business and the principal things I got out of that were experience and the ability to handle 50 tons of blocks a day without undue fatigue.

"At present I do whatever I find interesting. Mrs. Connor and I generally do some traveling in the winter. Landscape painting, tennis, boat building, and chess are my chief occupations. ... We are so far from Boston that whenever I am up there I am in a hurry. However, the hope that we shall see each other before our 25th is mutual. Every year Ted Brown, who is in the insurance business and lives in Manchester with his fine family, and I hold a little reunion of our own and go hunting. We always have a

wonderful time and generally bag some game. ... If you are in this neighborhood at any time or wish to take a 100-mile ride, come in to lunch and we will go snowshoeing, or play tennis, or even golf, although golf isn't my game."

And this splendid bit from Vincent Maconi, New Haven, Conn.: "The reason I have not written to you more frequently is that my domestic and business set-ups have not changed in recent years. I am still vice-president of the Dwight Building Company and have the same family, consisting of my wife and three children: Richard, 13; Norman, nine; Lois, seven. My experiences during the last few trying years have probably cost me a few more hairs, but, after all, the loss wasn't so great because I failed to qualify as a 'billiard ball top' at the last reunion. Our company came through the depression very successfully — 1930, 1931, and 1932 being especially good years for us. We have also succeeded in keeping in the black for the combined years of 1933, 1934, and 1935. We are quite satisfied with our showing when we consider the low point the construction industry reached during the depression. The immediate future looks more promising to us, assuming, of course, that business is not upset by further excess spending by the government.

"Now for the sad news: My golf scores still hover around the low 90's and I must admit that I never expect to get much better. At times I wonder how scores in the 70's and 80's are made. If you can offer any advice along this line, please let me have it at once. Understand, of course, that I can pull my scores down considerably if, after the games, I adjust the gross scores for the obvious bad breaks and indifferent playing. Time and time again I miss putts under 10 feet which I would never miss if I really tried. ... I must stop now for two good reasons: one being that I must get back to work and the other that I should leave some space for the other boys."

It's letters like these that ease the burden of being Class Secretary. Of course, I have to earn that beautiful watch you boys gave me last summer, so you will probably notice that our notes are getting better and longer. Naturally I cannot do this all alone, and I still want you all to continue helping me.

Louis H. Zepfler, as loyal as ever, writes this splendid letter: "I certainly enjoyed the reunion [1935], only I think we should stop numbering them from now on, or, rather, call them all 20th's as that one was the nearest to a perfect reunion that we've ever had. After seeing Arthur Ball's first Technicolor picture, 'Becky Sharp,' I was so impressed with the perfect color reproduction that I wrote him a letter of congratulation — a fan letter, if you will. He answered from Germany, where he was on his way to England to build up an organization.

"The January 24 meeting of the M.I.T. Club of Northern New Jersey, held in the Newark Athletic Club, was well attended. Vannevar Bush '16 gave a very interesting lecture with slides on new

developments at the Institute, after which he showed us the Edgerton high-speed movies. Charlie Fry was there. I tried to get Wentworth to come. He is assistant superintendent of industrial relations for the Western Electric. A group of M.I.T. men with my company (Standard Oil Company of New Jersey) in a moment of enthusiasm spontaneously organized an M.I.T. Club of the Standard Oil Company of New Jersey and elected me treasurer and paid their dues on the spot. Some of the members are Al Vought '18, McAndrew '30, Kenney '30, Wadt '33, Ross Dickson '14, Crane Herrman '25, and Frank Walsh '26. Due to changes at our plant, Eagle Works, my job as assistant general superintendent has changed and I may be at a different plant." From this you will see that Louis is interested in Institute affairs, and I sympathize with him in his treasurer position.

As these notes are being written we plan to have a 1915 Open House for all classmates at the Hotel Minerva, Boston, immediately preceding the big Alumni Dinner, Monday evening, June 8. I hope a lot of chaps will be there and the result will make an interesting first issue for us next fall. With this last issue I wish you all and your families a very happy and enjoyable summer. If any of you are here and will phone me during the day at Malden 2168, or in the evening at Longwood 3438, I'll be very glad to see you. Thus endeth our 21st year out of dear old M.I.T. — AZEL W. MACK, *Secretary*, 72 Charles Street, Malden, Mass.

## 1916

The publishing schedule of *The Review* makes it necessary to send in the following notes before our 20th reunion and a more complete report on this major event will not be possible until the first issue in the fall. The following are a number of items which were received after the first issue of the 1916 *News*: Jim Evans is in the Newark office of the Johns-Manville Corporation. He wrote: "My wife read your 1916 *News* and she questioned me in detail why I haven't reported that I was married, and further that I have one child — a daughter, 15 years of age, Miss Marjorie.

George Repetti is vice-president of the Holly Sugar Corporation, Colorado Springs, Colo. He wrote: "... I was ill for several weeks earlier this year and shortly thereafter had to go to New York to attend to some business there, which trip did not do me much good. So I took, what was for me, a rather extended vacation in the Hawaiian Islands and have just returned. I think, therefore, that it behooves me to stay on the job for a while." — Herb Gilkey, head of the department of theoretical and applied mechanics at the Iowa State College, Ames, Iowa: "Thank you for the copy of the 1916 *News*. ... May I congratulate the editorial staff upon the high literary quality of their publication. Moreover, I am greatly relieved to learn that so many of my classmates are still on deck, for I believe that we have little competition in vying for the honor of being the



1916 Continued

most modest of all classes graduated in the past 50 years, judging by the amount of publicity that we have accorded to ourselves in the alumni notes of *The Review*. Perhaps the situation may improve (or get worse, depending upon how the item of publicity may be classified) as a result of the momentum that you fellows have created. Now, please don't take this as an implied indictment from one who has been holding up his end faithfully, for I merely write as perhaps the guiltiest member of a guilty crowd, and in fact my name is almost spelled that way. . . ."

Steve Berke: "I am living in Newton, Mass.; have one wife, one girl, aged five, and boy, aged four. Am with Coleman Brothers Corporation, Boston, on bridges, roads, and so on." — E. C. Gagnon is a long way from home: "This will be rather late for first edition, but your request reached me only April 23. . . . Have no children. Am in charge of development department of Goodrich Tire factory at Argentina and have been living here over five years. If any '16 men have been around here, I have not heard of it. It is a long way from home for most of them, I think. Best wishes for a successful reunion and may it be as happy a one as the last time I was out with the Class of 1916." — Wes Blank wrote from Melrose, Mass.: "Married and have a 12-year son and eight-year daughter. Business badly shot by depression; formerly managing engineer in charge of sales of Babcock-Davis Corporation, Boston; now wrestling back as structural engineer with Boston and Maine Railroad on bridge work. You will remember that they and their bridges got washed up also. Have seen McSweeney, Burke, Fletcher, Liddell." — R. E. Gruber: ". . . Have been in England, then one month in Germany, now Austria, then France and England again."

Paul Austin is still on the Pacific Coast and reported for the past five years: "Have been with the Standard Oil Company of California for that length of time, for the last three years in the engineering department. The only '16 men in this part of California, so far as I know, are Charles F. Gross and Jack Heller. Charles is with the Shell Oil Company here in San Francisco and Jack is in business for himself — manufacturing and selling a device for carbureting butane." — Meade Bolton said that he was sorry not to have been able to attend the 20th reunion this year. He is architect of the Panama Canal and is still single. — Mark Lemmon from Dallas wrote, before reunion: "Wish I could be with you, but have to stay down here and help open the Texas Centennial on June 6. Have two buildings going up that must be completed by that date. Come to our celebration! Regards to you and the other '16 men."

Joe Meigs, who has been specializing in patent, trade-mark, and copyright matters, has announced the opening of a new office at 165 Broadway, New York City. — Bill Kniesner reported that his new office is located at the Lincoln Building, 60 East 42d Street, New York City.

Bill continues his practice of law, specializing in the fields of patents, trademarks, and fair trade practices. — Al Pettee, VI: "Now living at 1387 Asbury Avenue, Winnetka, Ill. District engineer for General Cable Corporation (copper wires and cables), 20 North Wacker Drive, Chicago, Ill. Travel about the central part of the country quite a bit, but find 1916 men very scarce. Where are they all? — especially the course VI men?" — HENRY B. SHEPARD, *Secretary*, 269 Highland Street, West Newton, Mass. CHARLES W. LOOMIS, *Assistant Secretary*, Bemis Bro. Bag Company, Memphis, Tenn.

## 1917

Frank Maguire has joined the Beck, Koller Company and, although he has headquarters in Elizabeth, N. J., has been traveling over much of the industrial East seeking new specialty outlets for the resinous products for which his company is well known. It will be recalled that he was formerly an associate of Ray Blanchard's at the Hood Rubber Company.

I. B. Crosby has been spending much time lately at Passamaquoddy and has been good enough to give us this comment on his activities there: "This is to let you know that I have returned from my last trip to Eastport. I was appointed consulting geologist on the Passamaquoddy Tidal Power Project last August, and have made numerous trips and spent much time there since then. The problems put up to me there included examining and reporting on 60 dam sites. Eight of these are for dams across tidal channels, in order to keep water of Cobscook Bay at high tide level, and the remainder were in connection with two alternate plans for a pump storage reservoir. It is a unique and most interesting project. Many of the problems are most unusual and in some cases contrary to what one usually finds on a hydroelectric development. I saw Hunt and Ray, both '17 men, occasionally, and also Moses Pike '20, who had charge of the general engineering division. Last fall I began studies for a large storage dam on the upper Connecticut River, and shall resume field work there soon. Another Tech man, Richard S. Holmgren '19, has charge of this project as chief engineer of the New Hampshire water resources board."

Many a preconceived impression of Kansas City was revised when various M.I.T. men stopped there for the Chemical Society meeting in April. An outstanding contribution to the position the city now takes as a leading metropolis is the William Rockhill Nelson Gallery of Art; the directing genius there is J. Paul Gardner mentioned in these columns last autumn. — I dropped in on Paul unannounced after a trip through his gallery that was comparatively brief but sufficient to inspire respect and a bit of awe for the responsibility he bears. The Nelson Gallery has taken its place as fifth in importance among the art institutions and galleries of the country, where it stands in a little class by itself, next after the four major collections

headed by the Metropolitan in New York with its enormous endowment. From comments dropped by some of the natives it appears that, along with the gallery, Paul himself has become somewhat of a local institution and a leader in cultural activities in the district. The adequate preparation which he had for his work and the serious and capable study he has given involved problems show satisfying effect in the material his staff have gathered and in the skillful manner in which it is displayed for fullest effectiveness. For reasons most carefully weighed, emphasis is placed on the Oriental collection and it has already achieved recognition as among the world's best. Incidentally, Paul appears in good health and makes a gracious host to uncultured hicks from the East.

Duncan MacRae brought his smile to the Kansas City meeting and the weather became warm and balmy — 87 degrees F. and well above seasonal normal. His duties with the Chemical Warfare Service do not permit of much gossip for general publication, but they keep him busy maintaining effective touch with both Army and Navy, as well as with members of the chemical profession, particularly the reserve specialists scattered over the country. He reports that Stanley Chisholm is with Philip Morris, with headquarters at 180 North Wacker Drive, Chicago, Ill., and is engaged principally in lecturing to medical conventions.

A recent New York *Herald Tribune* lists an important item under a Nassau, Bahamas, date line: "Mr. and Mrs. J. Henry Stagg, Jr., who were married here on Washington's Birthday at 'Florence Villa,' the winter home of Mr. and Mrs. John F. McCarthy, sailed today on the *S.S. Carinthia* for New York. Mrs. Stagg is the former Miss Elinor M. Lusk, daughter of former State Senator Clayton R. Lusk and Mrs. Lusk of Cortland, N. Y. She is a graduate of Smith College in the Class of 1930 and the Sorbonne in Paris. Mr. Stagg resides in Fairfield, Conn. He is president and treasurer of the Hawley Hardware Company of Bridgeport, Conn. A graduate of M.I.T. in the Class of 1917, he was an ensign in the United States Navy in the World War, serving with Admiral Earle. He is a member of the University Club and Brooklawn Country Club, Bridgeport, Conn."

Ralph H. Ross has been transferred as of June 1 from New York to Philadelphia. He writes in part as follows: "I will become division plant superintendent of the American Telephone and Telegraph Company, long lines department, and will be responsible for the maintenance and plant engineering of that company's plant and services in the states of Pennsylvania, Delaware, Maryland, Virginia, and West Virginia, and in the District of Columbia. I expect to be moderately well occupied but will always be glad to welcome visitors at my office in the Bourse Building on Fifth Street between Market and Chestnut. My personal status has remained un-

1917 Continued

changed for some years. I am still married to the same wife and am responsible for, but not in control of, five active and rapidly maturing children. It will not be long before I learn through bitter experience what it meant to father to put me through the Institute. However, the older four are girls and, as yet, none of them has displayed serious interest in the advantages of being a coed at M.I.T."

As these notes are being written, notice comes of Edgar S. Gorrell's part in the Transportation Symposium scheduled for the Alumni Day program. The New York Times's aeronautical column "Contact" spoke as follows of some of his recent activities: "Formation of the Air Transport Association of America with Colonel Edgar S. Gorrell, former chief of staff of the air services of the American Expeditionary Force, as its 'czar' marks a further hopeful step toward coordination and progress on the part of the operators. The avowed purposes of the organization include the promotion and development of 'the business of transporting persons, goods, and mail by aircraft between fixed termini on regular schedule, and through special service, to the end that the best interests of the public and the members of the association be served' and to 'promote the construction of proper airports and airway aids over such routes as will best insure benefit to the public . . . and the maintenance, repair, and improvement of all airports used by air-line operators.' The members of the association further avow their aim to promote aviation safety in general. Colonel Gorrell's past record, as an honor student at West Point, adjutant of the first aerial squadron under General Pershing in Mexico, special student at M.I.T., chief engineer of the Air Services abroad, later its chief of staff, and after that his experience as general manager of Marmon and president of Stutz for 12 years, fit him exceptionally for his new post. Associated with him as officers of the association are W. A. Patterson, President of United Air Lines, as vice-president, and Fowler W. Barker, formerly of the transport division of the Aeronautical Chamber's Washington office, as secretary-treasurer." — RAYMOND S. STEVENS, *Secretary*, 30 Charles River Road, Cambridge, Mass.

## 1918

Responding antiphonally, with the help of a few clippings and a visit or so, to the cry of the editors for noteworthy news, we report that a long-range campaign to expand American and foreign markets for domestic rum is under way: "Señor Alvare . . . formerly chief engineer in charge of production for Bacardi Corporation of Santiago, Cuba, told newspaper representatives: 'To deny that true Cuban-type rum can be produced in America is to deny that no biological medical product from anywhere is good except in the place where it first originates.' He declared that, given the highest grade Cuban raw materials, the proper equipment, and the right kind of supervision, Siboney Rum can be produced, equal or superior to imported varieties."

The puritan in us shudders haughtily and turns to the next item which happens to be Bill Wills again, by reason of the fact that the merits of one of his gaunt, white, frame houses won the \$1,000 grand sweepstake prize offered by *Better Homes and Gardens*. There were 15,226 competitors to keep the judges from gathering dust. Bill swears he stopped breathing altogether when the award was announced, but we believe the fact that he also won fourth prize had something to do with respiration.

Alfred B. Vought writes that he has forsaken 269 Harrison Avenue, Jersey City, N. J., for that far-off land of forgetfulness, Soengei Gerong, Palembang, Sumatra, N.E.I. (care of N.K.P.M.). After a decade in and about the three New York refineries of the Standard Vacuum Oil Company, now comes the glamorous adventure and a promise to shatter the silence of the Orient with a sumptuous assemblage of items for this column which shall echo dreadful and magnificent truths.

Stuart Boyd, driving a panting '36 Chevrolet, revisited the Institute in the early spring, thereby affording opportunity to do his portrait in whispers. In charge of research and development of footwear at the Naugatuck, Conn., plant of the United States Rubber Company, he has three Tech men working for him: Hunt '35, Stackpole '34, and Charles Eliot Ware, 3d, '35. Sons Weston and Robert are 13 and nine years respectively. Stuart was president of the local alumni club in 1932, a flourishing organization of 157 members, all passionately devoted to the interests of Alma Mammy. But our imagination needed all the elasticity of the very best United States Rubber to grasp the story that last year he drove 6,800 miles in 14 days and wasn't even being pursued by the sheriff.

A few interesting address changes from our foot-loose brethren include: Masayuki Tatsuno, 653 Kinuta-Seijo, Kinutamura, Tokyo, Japan; Yu C. Tu, Physics Department, University of Shanghai, House Number 17-771, Chungkung Road, Shanghai, China; Kwei L. Hsueh, care of Yen Wu Shu, Ministry of Finance, Nanking, China; Dr. William W. Peter, United States Indian Service, Navajo Agency, Fort Defiance, Ariz.; Percy W. Carr, 938 Sheridan Avenue, Elizabeth, N. J.; Professor Samuel V. Chamberlain, back from France again, this time alighting at 8 Tucker Street, Marblehead, Mass. — F. ALEXANDER MAGOUN, *Secretary*, Room 4-136, M.I.T., Cambridge, Mass. GRETCHEN A. PALMER, *Assistant Secretary*, The Thomas School, The Wilson Road, Rowayton, Conn.

## 1919

The Review Editors went to considerable trouble to sandwich our notes in the last issue and their coöperation is greatly appreciated. In view of the lateness of their arrival it was necessary to cut them short. Nevertheless, we received a very gratifying response from class members, particularly in view of the suddenness of our reappearance in print.

One of the high lights is a letter from Harold Marshall, Palmyra, N. J., who calls our attention to *Automotive Industries* for April 25, which gives a brief biography of our own Charlie Chayne's rise to chief engineer of the Buick Motor Company. Thanks a lot, Harold, and how about a little news of yourself? — Another interesting bit of news is the arrival on March 18 of Eugene Ralph Smoley, Jr. Congratulations, Gene, and let's hear how things are going!

I see Bob Bolan occasionally at the Hygrade Sylvania Corporation in Salem, where he is chief engineer, and have also been to his ranch in Hamilton, where his three children have a wonderful time running over acres of land. — I received a corking letter from Bernard Coleman who is secretary of the New York Tuberculosis and Health Association. After enlisting in the regular army, Bernard returned to the Institute as private assistant to the late Professor Sedgwick; then followed work with the Montclair Water Company in New Jersey, and with the New Jersey and Hudson County Tuberculosis Leagues, municipal relief director of Paterson and Passaic, N. J., and finally his present position. Bernard has two sons, seven and ten years old. Thanks a lot for your very interesting letter, Bernard, and let's hear from you again.

A letter came also from Oscar de Lima, who has an executive position in New York City with the Roger Smith Hotels. He advises that Don Way is somewhere in Italy at the present time. How about some news of yourself, Oscar? — I have notes on several other class members including Art Kenison, Art Blake, Art Griffin, Russ Palmer, Roger Leland, and George McCreery, but we want a response from every member and with typical New England conservatism we are going to hold the rest for subsequent issues. It is very encouraging to have so much news come in on such short notice. We hope all will make a special effort to write regularly, supplying news of themselves and other members of the Class. — ARKLEY S. RICHARDS, *Secretary*, 26 Parker Street, Newton Centre, Mass.

## 1921

Again we come to the annual pause in our series of meetings in the columns of The Review, this time until November — a somewhat longer pause than in the past. Meanwhile, our Fine Fifteenth Reunion will have taken place. Naturally, we hope that you, dear reader, were one of those who enjoyed the June Jamboree and that you will not, therefore, have to withstand the suspense of waiting so long for a report on the big doings. To those who find the lengthy wait unbearable, a note to your Secretaries will receive prompt attention and will be most welcome. All others of the clan are invited to take advantage of the longer days and gladden the hearts of your Secretaries with longer letters of personal news and the happenings of 15 years.

News has just reached us that S. Paul Johnston, who sent a long letter referred to in the last issue, has just been ap-



1921 Continued

pointed editor of *Aviation*, published by McGraw-Hill Publishing Company, New York City. Paul was in the Army Air Corps during the War and later was connected with the production of aluminum alloys for aircraft materials by the Aluminum Company of America. He is co-author with E. P. Warner '17 of "Aviation Handbook," and the forthcoming aeronautics section of Kent's "Mechanical Engineer's Handbook." Paul is an honorary member of interairline maintenance committee under the Air Transport Association; member of the A. T. C. committee, contest board of the National Aeronautic Association; and member of the Institute of the Aeronautical Sciences. Congratulations, Paul!

A clipping from the *Boston Globe* of April 7 announces the marriage of Miss Catherine Clifford to Albert Superior Genaske at the Harvard Church, Brookline, Mass. The former Miss Clifford is a graduate of Boston University and Bryant and Stratton Business College. Al is assistant engineer of the Metropolitan District Water Supply Commission of Boston. The newlyweds are at home at 32 Hyde Street, Newton Highlands, where we hereby send best wishes from the Class.

Two memorandums from Professor Locke '96 tell us more about A. G. H. Andersen and Ernest R. Gordon. Andy, who makes his home in Brooklyn, N. Y., is now in the research department of the Phelps-Dodge Corporation at Laurel Hill, N. Y. Ernie Gordon is still with the Amparo Mining Company but has been detached from superintendency of the Guanajuato, Mexico, mine and has been assigned to investigate new company properties in the San Juan district of Colorado, where his address is Box 81, Durango, Colo. A new member, Elsie Catherine, joined the Gordon family on February 22. Congratulations and best wishes from all of us! Ernie asks that all Technology men near him this summer please look him up.

A pleasant and enjoyable summer to everybody; don't forget to jot down news of yourself and the classmates you meet and send it along to your Secretaries. — RAYMOND A. ST. LAURENT, *Secretary*, Rogers Paper Manufacturing Company, Manchester, Conn. CAROLE A. CLARKE, *Assistant Secretary*, Acousticon Division, Dictograph Products Company, Inc., 580 Fifth Avenue, New York, N. Y.

## 1922

It is with regret that we are obliged to report the death of Finn Borchgrevink in Norway on March 27. We are not aware of the details but Professor Schell '12, on a recent visit to Rochester, told us that he had just received word from one of the other Norwegian Alumni. Borchgrevink was a member of Course XV and we are sure that all XV men will be sorry to hear of his death.

There is very little news in the file this month. Possibly the spring weather has turned letter writing into an insurmountable task. A year from now our Class will have gathered for its 15th reunion. It is not too early to start making plans for

this event and if any of you can forecast your activities this far in advance, we urge you to bear this in mind. This might particularly apply to any members of the Class located in the Far West, Alaska, or South Africa, who might be able to arrange a business trip to New England on an expense account some time during the early part of June, 1937. — We wish you all a happy summer and will be interested in hearing from any members of the Class who may be blessed with any leisure time during the few months intervening between now and the next issue of *The Review*. — C. KING CROFTON, *Secretary*, Rochester and Pittsburgh Coal Company, 604 Lincoln-Alliance Bank Building, Rochester, N. Y.

## 1923

On May 30 the first of what is likely to be a series of get-togethers for 1923 men in the Boston district was held at luncheon in the Boston Chamber of Commerce Building. Howard F. Russell, II, recently came to Boston to take a job with the Boston Manufacturers' Mutual Fire Insurance Company and was disappointed to find that none of the gang in and around Boston had shown gumption enough to get together once in a while. Now he has a job doing something about it and the luncheon was the result. It was put on a strictly "take-it-or-leave-it" basis: No one was pressed to turn out and no formal program was arranged. The following 20 men showed up and voted to do it again some time, so the party may be regarded a success: A. A. Kenney, I; F. K. Haven, Fred Mann, H. F. Russell, and A. C. Whiting, II; W. A. Gallup, V; C. T. Burke, M. K. Chandler, C. M. Haig, E. C. Rue, J. A. Stratton, D. E. Washburn, and E. W. Willis, VI; B. E. Proctor, VII; H. M. Chatto, IX-B; H. F. Cotter, X; C. H. Chaisson and Archie Williams, Jr., XIII; J. E. Brackett and H. L. Bond, XV.

Pete Pennypacker, XIII, has taken a new job with the Bethlehem Shipbuilding Corporation at Fore River, and soon expects to move his family here from New Jersey. Pete has been an important member of the group which has maintained such a live interest in New York and will be a valued addition to Boston.

W. E. R. Covell, I, sent a card from Singapore in March: "Mrs. Covell and I are just half way round on our trip from Panama to my new station as district engineer, Pittsburgh, Pa. A four months' leave is permitting us to go via the Suez. Am now a lieutenant colonel, Corps of Engineers. Had the pleasure of showing Gerard Swope '95 around the Canal before I left." — Dudley Moore, IV, is, I regret to report, an invalid. He is living at Norfolk Street in Holliston. He is appreciative of friends who can visit him. — R. H. Frazier, VI, became engaged on April 11 to Miss Vivian Maud Skilton of Lawrence, Kansas. Dick is on exchange from Technology, as assistant professor in the department of electrical engineering at the University of Kansas. The wedding was set for June 13, so will be accomplished by the time these notes appear.

Munson T. Adams, VI, died in New York of pneumonia on April 3, and was buried in East Washington, N. H. After leaving Technology he took a course at the Harvard Radio School and served as radio operator on United States Navy destroyers throughout the War. He became radio editor for the *Boston Herald* when this department was an innovation in the newspaper field. Subsequently Adams served in other branches of newspaper work with the Associated Press, United Press, and the *New York World*. He was director of publicity for the national air races at Cleveland and was for some time associated with the publicity firm of Bruno and Blythe.

From the *Boston Transcript*, I cull the information that Channing Clapp, XIV, was married on April 11 to Miss Louise Fennon of Metuchen, N. J. The ceremony was performed at the First Parish Unitarian Church in Dorchester, Clapp's home town. The couple will live in Metuchen, N. J., where Clapp works for the Carborundum Company and is also president of the Metuchen Kiwanis Club. — I have it on authority of the *New York Herald Tribune* that G. Bertrand Will, X, was married on April 5 in Glen Ridge, N. J., to Miss Ruth Morris Hyne of that town. — HORATIO L. BOND, *Secretary*, 195 Elm Street, Braintree, Mass. JAMES A. PENNYPACKER, *Assistant Secretary*, 96 Munroe Road, Quincy, Mass.

## 1924

We are indebted to two 1923 men, Pete Pennypacker and Ray Bond, for a considerable volume of notes this month. Attending a recent gathering where members of the two classes met there were reported as present the following: Mr. and Mrs. Roland N. Black (New York Telephone Company); Mr. and Mrs. Anatole Gruehr (New York Edison Company); Mr. and Mrs. William W. Sturdy (Bell Telephone Laboratories); Mr. and Mrs. Malcolm S. MacNaught (McGraw-Hill Publishing Company); Mr. and Mrs. Richard F. Shea (Fada Radio and Electric Company); Mr. and Mrs. Perry Maynard (American Telephone and Telegraph Company); Mr. and Mrs. Isaac Brimberg (radio engineer, city of New York); Mr. and Mrs. Frank Hecht (Ebasco Services, Inc.); Mr. and Mrs. H. Gregory Shea (Lazard Frères); Mr. and Mrs. Thomas F. Bundy (E. F. Hauserman Company); Mr. and Mrs. William H. Correale (Commissioner of Water, Gas and Electricity, New York); Henry Shore (Radio Corporation of America); Charles A. Frank, Jr. (Bankers Trust Company of New York); L. L. Tremaine (Massachusetts Mutual Life Insurance Company).

From a clipping from *The Review* office we learn that Jack Spaulding is treasurer of the New Century Company of Chicago. — Ed Hanley has been made secretary of the Allegheny Steel Company and has recently moved from Schenectady to Pittsburgh. — Recently announced is the engagement of Miss Lila Mae MacAskill of Newton, Mass., to Martin J. Buerger, now associate professor of mineralogy and petrography at the Institute.

1924 Continued

From Rodney Dutcher's column titled the "Political Pie" in the New York *World Telegram* we learn that engineering has taken a new bent. David Lasser, President of the Workers' Alliance (Socialist), leads his organization to Washington for convention and parade, and keeps under his thumb, so the story goes, the more radical Communist detachment which has joined him.

Bill Correale writes as follows: "I noticed in the magazine called *Water Works Engineering* that Ed Jagger has just been elected chairman of the southeastern section of the American Water Works Association. I note also that Ed is listed as being chief engineer of the Alabama Water Service Company, located in Birmingham.

"Several of us attended the Diamond Jubilee Dinner last night. Besides myself there were Anatole Gruehr, Ed Wininger, Dick Lassiter, Bert Grahame, and Harry Cuthbertson. Ed Wininger is now an officer of the firm of Wininger and Selby, Inc., doing a contracting business, with offices in New York. Bert Grahame is with the Texas Oil Company." — FRANCIS A. BARRETT, *General Secretary*, 50 Oliver Street, Boston, Mass.

## 1926

These notes are written on the eve of our reunion and therefore may be filled with coals on the way to Newcastle. Professor Charlie Locke '96, however, who is a Saint Boniface of our traveling miners as well as a patron saint of class secretaries, has provided us with so much material that it must be presented. I take his items first: Cyril S. Smith of the research laboratory of the American Brass Company in Waterbury, Conn., and W. Earl Lindlie of Divide, Mont., have been given the 1936 Annual Award Certificate of the Institute of Metals Division, American Institute of Mining and Metallurgical Engineers. This award is made for the paper which, in the opinion of the award committee, represents the most notable contribution to metallurgical science in the publications of the Division for the period covered by the award. The paper for which the 1936 award was made was "A Micrography Study of the Decomposition of the Beta Phase in the Copper-Aluminum System" (*Transactions, American Institute of Mining and Metallurgical Engineers, Institute of Metals Division, Volume 104, pages 69 to 105, 1933*). It describes a study of the mechanism of the transformation of an aluminum-copper alloy of eutectoid composition, containing about 12% aluminum, at various temperatures below the eutectoid temperature (which was re-determined as 570 degrees C.).

The following is an extract from a letter addressed to Professor Locke by Colin W. Reith, whose address is care of Bahrain Petroleum Company, Bahrain Islands, Persian Gulf: "Bahrain is the largest of a group of small islands in the Persian Gulf, 20 miles off the Arabian coast. Although the island is only 20 miles long and five miles wide and is little more than a desert of stone and sand,

estimates of population are around 100,000. The only outside source of income before oil was discovered was pearl diving. The Bahrain black pearl is reputed to be highly prized on the European markets. The islands have also attained recognition in another less glamorous way — Ripley 'Believe It or Not' has said it is the hottest place on earth. It's now mid-April and we are wearing sun helmets and shorts and running the fans, so maybe Ripley is right. . . .

"The Standard of California have a fairly large field here which they are rapidly developing. At present the oil is loaded on tankers through a three-mile submarine line, but a 10,000-barrel refinery is being rushed to completion and it is expected the capacity will eventually be doubled. The company also have a concession on all of Saudi Arabia and are drilling two tests. I am on a temporary assignment here, in charge of production and petroleum engineering — not temporary enough to miss the summer heat, however.

"I have often thought, and now I would like to express, my appreciation for your emphasis at M.I.T. on clarity and thoroughness in technical writing and thought." Classmates caring to send this had a cooling message may expedite their letters by marking them "Air Mail — Via London," and the postage is 25 cents per half ounce.

The mining property which Arthur Johnson has been developing at Idaho Springs, Colo., has come along so satisfactorily that it has attracted the attention of the American Smelting and Refining Company who have bought a 70% interest in it. This means that Johnson has apparently not sold all his interests. He is to continue in charge of the mine under the direction of the general manager in Salt Lake City.

Johnson's success is well deserved. His history since graduation is rather interesting. Coming from a mining family in Colorado, he was with the Aluminum Company of America in their metallurgical plant in New York State for several years, up to the time of the depression. Then he did some mining prospecting and examination in Canada. Two or three years ago he went back home to Boulder, Colo., and was successful in rehabilitating the St. Joe mine there, for which the company failed to give him the credit that was due. He therefore well deserved the recent success that has come to him.

Evan F. Wilson has been shifted from the Bureau of Standards in Washington to the United States Bureau of Mines station in Pittsburgh. — Bill Graves has reported the birth of a son.

I quote from *Fairchild Aviation News*: "To more effectively serve Fairchild customers throughout the world and to further expand the market for Fairchild products, a fifth subsidiary of the Fairchild Aviation Corporation has been organized. The new unit will be known as Fairchild Aviation, Inc., a New York corporation, and it will negotiate all the export sales and certain domestic sales of some of the Fairchild Aviation products.

"The new organization is located at the general headquarters of the Aerial Camera Company at 62-10 Woodside Avenue, Woodside, New York City. Ernest Robinson, who has been a leader in Fairchild aviation activities ever since their inception, is president. C. A. Harrison, who had been sales manager of the camera company and was active in bringing about the organization of the new unit, has been named vice-president. . . .

"Mr. Harrison, a graduate of the M.I.T. in 1926, began his aviation career as an advertising salesman on *Aviation* magazine. In July, 1928, he became assistant sales manager of International Aircraft Corporation of Cincinnati and in November, 1928, became advertising manager of the Fairchild Airplane Manufacturing Corporation at Farmingdale, Long Island. In October, 1929, he joined the camera company as sales manager and gave special attention to the development of the foreign markets." We hasten to congratulate Dave on his achievement in initiating this new company and on the esteem in which he is held as evidenced by his vice-presidency of it.

A small, blue card has come bearing this welcome news: "Mr. and Mrs. Gostan Gostanian announce the arrival of Frederick Kazar on May 22, weight, eight pounds, six ounces." — Boston and New York papers recently carried the announcement of the engagement of Miss Rosa Mitchell, daughter of the late Chief Justice Richard Mitchell of New York, to Frederick Balfe, Jr. — J. RHYNE KILLIAN, JR., *General Secretary*, Room 11-203, M.I.T., Cambridge, Mass.

## 1927

Glenn Jackson has written a very newsy and interesting letter which we are glad to pass on: "I am now living in Pawtucket, R. I., after a two-year sojourn in Norwich, Conn., as industrial engineer at our cotton and rayon finishing plant there. The company saw fit to promote me in January, so we moved back here, bag and baggage, during the season's worst storm. Living at 181 Raleigh Avenue, Pawtucket, and employed at the United States Finishing Company, Providence.

"While residing in Norwich, several interesting events happened: First, I bumped into none other than James Adam Lyles and his charming wife, who were spending a night at Ye Norwich Inn; secondly, my second son was born. James is the same regular politician and mustache wearer that he was at Tech, but even smoother and more jolly. The few minutes I spent with him and his wife were all too short, but I am looking forward to our 10th reunion when we can corral him into a good old-fashioned session. He is an investment banker, so prepare your questions ahead of time.

"Also, at the Norwich golf club, I bumped into Bill MacQuarrie, better known as Mac, who, with his wife, was attending the Harvard-Yale boat race. Mac hasn't changed much either and is with Electric Storage Battery in Boston.



"Last week George Houston dropped in on us from Boston, *en route* to his home in Wilmington. He is one of the mainstays of Mr. du Pont's real estate department and necessarily must do considerable traveling. George enjoys his work and the Houstons like Wilmington. A year or so ago, Betty and I were returning from a motor trip in the Carolinas and spent a night with the Houstons at Wilmington, and believe me, they have a swell daughter, Carol, aged four this June.

"A recent arrival in Providence from Wilmington is Wheaton Hutchison, who also furthers du Pont's interest in New England, and pounds upon my door occasionally. Wheat and his wife are natives of these parts and so are the Jacks, so we find plenty of dirt to hash over on long winter evenings. — Dave Truax is plant chemist at our Sterling, Conn., plant. — Dale Stetson is with R. H. Macy and Company in Manhattan, but in his spare time does murals. If you don't believe it, go down to Courtland Street and see the much talked about work on the walls of the East River Savings Bank when you're in New York. He dropped in to see me when we were in Norwich, being *en route* to Maine with his wife and two children.

"Joe Burley is still carrying on for the Boston Insulated Wire and Cable. — George Houston says he saw Carl Whittier in Toledo and inspected Carl's office in the new glass building of the Owens-Illinois Glass Company. — My wife recently had a letter from Mrs. John Oliver Collins whose husband, Johnny, is still holding the fort with Standard Oil of New Jersey and living at Westfield, N. J. — Carl Davies writes from Charleston, S. C., that business looks fair and the life of a country gentleman will soon be his." Glad to note that Glenn is already planning for our 10th reunion next June. It will be a grand time and it's a swell idea to make your decision now to be among those present.

A clipping from the March 14 issue of the Boston *Transcript* tells of the marriage of Miss Marjore A. Diehl to Walter F. Blake of Quincy, Mass. Miss Diehl attended Bradford Academy and Miss McClintock's School in Boston. — Jimmy Chirurg is the prosperous owner of James Thomas Chirurg Company, 216 Tremont Street, Boston, Mass. Jimmy and his staff are advertising counsel for several large industrial concerns in New England. He married Virginia B. Low of Brockton on October 20, 1934. Jim apparently continued his interest in Wellesley long after the majority of us, as Virginia was graduated from that able institution in June, 1934. They live on Orient Avenue, Newton Centre.

The Bell Laboratories *Record* has given word on I. L. Hopkins: "He immediately joined the materials department of the Laboratories. He was engaged at first in investigations relating to insulating materials including the development of testing methods and apparatus, and the preparations of raw-material specifications. For the past year he has spent most of his time on various problems connected

with hard and soft rubber and the testing of phenol plastics." — JOHN D. CRAWFORD, *General Secretary*, General Radio Company, 30 State Street, Cambridge, Mass. RAYMOND F. HIBBERT, *Assistant Secretary*, The Gill Corporation, 238 Main Street, Cambridge, Mass.

## 1928

Lend thy ear, engineer, for thou art about to be inflicted with another gentle dose of "statisti classicum," or "factum Twenty-Eightum." Consider well, if thou art single, how few are thy ranks; if thou art double, why art thou not triple? And if thou art triple, quadruple, quintuple, or sextuple (as are the Jim Kohlers), reflect back on that state of single blessedness when thou wert a free man and not so happy, for all thy freedom.

Returns from the class letter which was mailed to our 625 members on February 18 continue to dribble in as late as the date of this writing. Apparently some of the gang are holding the letters for the 10th year reunion. One-hundred-and-nine replies (or 17.4%) have been received to date. Eighty fellows enclosed money; one generous gentleman sent in two dollars, so our gross return at the moment is \$81. Our expenses, as explained in the May Review, were \$24.59, leaving \$56.41 for a 1928 fund for undergraduate athletics. Although we recognize that a 17.4% return is perfectly swell for any direct mail proposition, we still are of the opinion that it's a poor showing on a class letter. One-hundred-and-nine returns from a mailing of 625 letters is low from the class point of view, but it is quite ample as a statistical sample, so without further ado, here's a recapitulation of the vital statistics: Only 27.5% of the Class are still single; 44.9% have children or 62% of those married have children. Boys outnumber girls by a ratio of 41 to 32. At this point, the married group average one-and-one-half offspring for each family. I expect someone will now write in and ask me to describe "half an offspring."

Well, let's proceed to cases where we left off in the May issue. In passing, let me explain that we've had to cut some of the autobiographies to get 37 of them in this last issue before fall. — Bruce Hart is now service engineer in charge of military service work for the sales department of Wright Aeronautical Corporation. Previous to that he was an experimental engineer for the same company. Bruce is also a commissioned lieutenant in the United States Naval Reserves. He has a seven-year-old boy and a two-year-old girl.

Dick Hildick is assistant to the vice-president in charge of manufacturing of the Kendall Company, manufacturers of surgical dressings. He says the work gives him a very interesting range of jobs as the company has 14 manufacturing plants located in the South, East, Mid-west, and Canada. Dick was married in 1930 and lives at 31 South Main Street in Sharon, Mass. — My big news about Ernie Knight is his marriage on June 27.

Imagine the handsome old "bach" holding out this long. Congratulations, Ernie, she's a wonderful girl, but that's no news to you. The pride of the Knight family is working day and night on refrigeration development for Westinghouse in Springfield, Mass. He admitted he would mend his ways after he was married. Ernie reports that Ev Lester is still going places with Pratt and Whitney, in fact to Canada on some demonstration work. — Slim Maeser is with United Shoe Machinery Corporation in Beverly. His job is a secret at the moment, but on the side he's running the "Maeser Institute of Technology," named by 12 students whom Slim is tutoring in elementary math so they can enter Lowell Institute. The Maeser offspring numbers just one, a girl, aged nine months.

Ed Morris has had many varied jobs with Westinghouse since graduation. At present he is at Chicopee Falls, Mass., in charge of commercial sales work of all radio apparatus except that sold to the United States government. His main interest is in police, aviation, and railroad communication equipment. Yes, sir, Ed's still a bachelor. — Pres Carter has been employed by the Aluminum Company of America for the past eight years as a metallurgist. He is living in New Kensington, Pa., and has a girl, one year old.

Ken Clark sent a very enthusiastic letter from Chicago where he is working for S. A. Healy Company, general contractors. He has worked on many sanitary disposal plants, dams, sewers, and tunnel jobs and spoke very highly of his employers. Ken has a little girl, aged eight months, in his family. — Ames Hettrick was with Stone and Webster, but during the depression he transferred to the Southern Mineral Products Corporation whose mill Stone and Webster built. Ames has progressed rapidly; was chief engineer for three years and last fall he was placed in operating charge of the property. He highly recommends Piney River, Va., as a place to live. He has one boy, aged two years.

Jim Kohler, with four boys, aged two, four, six, and nine, sets the class record. Jim is with "Kohler of Kohler," Wisconsin, and he says his "next letter, about 1945, will probably say the same as this — that I am well, happy, and wish I were prosperous." Jim says Dick Goble of the McGean Chemical Company stops in once in a while and the pair weep in their beer at the corner tavern. — Clarence Prendergast, one of Course VI-A's bachelor group, is with the Western Electric Company in Chicago.

Andy Anderson is down in Baton Rouge, La., with the Ethyl Gasoline Corporation. He has four assistants in his laboratory and has stayed single in spite of 1,500 coeds in Baton Rouge. He says his company weathered the depression very well and also mentioned that he manages to play golf almost every day in the summer. — Harry Cade has the imposing titles of sole owner, head master, treasurer, manager, teacher of physics, secretary, director of advertising, personnel

advisor, and dean of Berkeley Preparatory School, 1089 Boylston Street, Boston. He was married in 1931 and Dave Stanley was his best man. Harry also mentioned that Carl Harris married Miss Caroline Keene, who was a bridesmaid at his wedding. He would like to hear from Arthur Campopiano, Hector Hagedorn, John Campobasso, and Arthur Keith.

Herm Daiker is now owner, proprietor, and operator of the Daiker Nurseries at Bridgewater, Mass. He got into this work from an interest in real estate and then started a landscape and nursery business. Herm was married in 1929. — George Hoffman, another Course VI bachelor, is approving design and construction of the electrical equipment of the new subway cars for the New York Eighth Avenue subway. His work is being done by the Board of Transportation of the city of New York.

Tom Larson has had numerous jobs in both the dyestuff and textile businesses. Now he's chemist, salesman, and demonstrator of dyestuffs for Calco Chemical Company's branch office in Providence. His home is in Pawtucket and he has a bouncing one-year-old boy. Tom still believes he can take Jerry MacGillivray in golf. The 10th year reunion is coming, Jerry! — Sam Shure, II, was very brief and to the point. He works for Natkin and Company of Kansas City, Mo., and has a little girl, aged four. — Frank Wattendorf's letter was answered by his father, for Frank is now a professor of aeronautics at Tsing Hua University at Peiping, China. He is still single.

Hall Hibbard has worked with Stearman Aircraft Company, Viking Flying Boat Company, Varney-Stearman Aircraft Company, and then he worked up to chief engineer of the Lockheed Aircraft Corporation. Hall is now vice-president, chief engineer, and a member of the board of directors of the latter corporation. Last October the German government paid his expenses to and from Berlin to give a lecture before their research society called "D. U. L." We congratulate Hall on his rapid and brilliant progress and also upon his election to the council of the Institute of the Aeronautical Sciences.

Dick Rubin is doing talking-picture and sound-engineering work. He developed a special dynamic speaker several years ago which won him a promotion. Now he owns his own theater, the State at Saugus, Mass., and has several theaters under maintenance contracts. Dick has three boys: the first two aged five and three; the third was born on February 29. Dick says this last lad will be the youngest in the Class of 1953, M.I.T., for at that time he will be only four years old. — Joe Parks is now assistant plant superintendent at the Gleason Works in Rochester, N. Y., and is living at the University Club in Rochester. This is a new job for Joe because for a number of years he worked at the Anderson Manufacturing Company (spring covers) in Cambridge. Joe is one of Course II's perennial bachelors, but the betting is he'll get someone in Rochester!

Next cometh Fred Riley of whom we've seen neither hide nor hair. Fred was married in 1934 and is now with the Lawrence Gas and Electric Company. — Art Robinson is assistant highway bridge engineer with the United States Bureau of Public Roads at Albany. His territory includes the New England states, New York, and New Jersey. — Ed Holmes is with this same bureau in Washington, working out traffic and speed surveys. Art and Ed got together for a game of golf last summer. — Bill Snyder is assistant secretary and general superintendent of the Globe Superior Corporation at Abingdon, Ill. Bill was married in 1928 and has a baby girl, aged one year. — Abe Woolf was married on December 8, and he says it's the best step he's taken since graduation. He is now working for M. Linenthal, structural engineers, of Boston. — Al Gracia said he thought all Course X men had become G-men and wouldn't talk and thus he endorses this class letter idea. Al's autobiography was published in these columns two months ago. You'll find him at the Goodyear Tire and Rubber Company.

Tom Wood had charge of the blowing room for Pyrex (Corning Glass Works) for several years, but in November he was made assistant manager of the company's radio and lamp bulb plant at Wellsboro, Pa., which position he now holds and says he enjoys very much. Tom has two boys — ages: four years and six months — and one girl, aged two years, plus. — John Grant is also with the Corning Glass Works, where he is working on the development of glass wool.

Newt Foster reports that he and D. H. Spitzli and Jerry Brickett are the only remaining '28 men of the original group of eight that went with Congoleum-Nairn, Inc. Newt is in the development department trying to make more and better congoeum products. He had a rather serious automobile accident in 1934 while coming back from the World's Fair when his car was hit by a drunken driver who was killed in the collision. — Waldo Keyes was working for the sound insulation division of Johns-Manville Corporation for several years, but is now with the General Heat and Appliance Company, the largest air-conditioning, cooling, and heating organization in New England. This company also specializes in glass-wool home insulation and Waldo feels there is a great future for home insulation and air conditioning. Yes, sir, he's still single.

Next is the right honorable Jonathon Q. Stack, who is working for the National Advisory Committee for Aeronautics at Langley Field and has been practically continuously engaged in investigation of air-flow phenomena at high velocities, which includes design of special instruments and apparatus. John is co-author of many very impressive articles on air flow, whose titles we regret we cannot publish for lack of room. John has a boy, aged two-and-a-half years, and a girl, aged six years, plus. — Frank Webster is with the Eastern Air Lines, Inc., a division of North

American Aviation, Inc. He has one boy, aged three, and two girls, ages one and eight.

Warren Armstrong has been with Certain-teed Products Corporation since graduation, having been chiefly engaged in the art of formulating paints. He's now at the Buffalo plant. Warren is still to be counted in the single ranks. — Jimmie Mitchell was with the Pacific Mills, but is now working for the American Briquet Company. He was married in 1932. — Roberta Lovely gave us a gentle admonition for questioning her about being single. She is still taking care of the health and well being of the town of Montclair, N. J., as bacteriological technician in its health department. — Doug Tooley is with Seversky Aircraft Corporation at Farmingdale, Long Island, N. Y. He lives in Amityville, L. I., and has one boy, aged four. Doug mentioned that Jack Bailey works for the Department of Commerce and lives at 117 Cockerille Avenue, Takoma Park, Md., and that Lou Miller is helping Brewster Aeronautical Corporation design and build an airplane.

Dal Sparre has worked up through various jobs with Du Pont and is now supervisor of synthetic resin production at their Toledo plant, working seven days a week, and he is on call 24 hours a day. He married Miss Geraldine Downs at Chevy Chase, Md., on May 12, 1934. — Dick Hoak is now sanitary engineer in the bureau of water of the Pennsylvania department of health, and has supervision of 187 waterworks and sewage disposal plants in 10 counties in southeastern Pennsylvania. Dick is still single after all these years! — Mal McCarroll's job is to get the sound that goes with any newsreel story shot in southern California, for he's with the Los Angeles bureau of Paramount Sound News. Mal has pretty well covered the Southwest on various jobs as well as special trips to Panama, Puerto Rico, New York, and last year a six weeks' trip to Honolulu to cover President Roosevelt's visit.

This is all the news we can pack into this issue of *The Review*; space permits no more. We know many will look for their story and be a bit peeved not to find it, so, partially to allay that, we will list the names of those men who will be covered in the subsequent issues of *The Review* next fall: Stachelhaus, Ackerman, Hutchings, Ferré, Morrill, Ellison, Hoppe, Goldstein, Hough, Batchelder, Cohen, Collins, Dean, DeCamp, Fleming, Flynn, Herzog, Horn, Hunn, Kelsey, Klegerman, Jack, Linebaugh, Moore, Palo, Ruch, Southwick, Sturznickle, Topping, Walton, Blackwood, Tobie, Perkins, Brown, Hu, Ikehara, Celette, Conroy, Allan, Grunwell, Brown, Clahane, Proctor, Smith, Russell, Worthen, Elliott, Muir, Kirwin, Kales, Wedlake, McGuane, Whitcomb, Page, Basilio, and Berry. Since writing the above, letters have come in from Leslie, Harris, Susmeyer, and Chamberlain.

*Percentage of Benedicts:* In Courses I, II, VI, X, and XV, there were sufficient returns to make the following amusing



1928 Continued

analysis on the subject of marriage. Graduates of Courses I and XV have showed greatest tendency to marry — the percentage married was 88.9 and 87.5 respectively. Course VI showed the least tendency to take the altar route — only 52.7% are married, while 64.3% of Course II graduates and 69.3% of Course X graduates are married.

Just as these notes were about to go to press we learned of the unfortunate and untimely death of H. Gardner Pratt, XV-2. At the time of his death Gardner was employed in Providence, R. I., by Blacher Brothers. To Gardner's parents and many friends the Class expresses its sincere sympathy. — GEORGE I. CHATFIELD, *General Secretary*, 5 Alben Street, Winchester, Mass.

## 1930

We are happy to bring news of the engagement of Jim Morton, XVI, to Miss Muriel Bassett of Newtonville, Mass., and of Jim Palmer, XV, to Miss Virginia Wallis of Dauphin, Pa. Congratulations to both Jims! — News comes to us from Kingston, Jamaica, that Charlie Ramsey, IX-B, is located there with Pan American Airways. — Bob Canning, XIV, has been advanced to the position of chief chemist by American Steel and Wire Company in Worcester. — Ed Hawkins, I, has been transferred to the Petersburg plant of the Virginia Electric and Power Company. Ed was formerly in Richmond.

Byron MacKusick, X, is now working in the laboratories of the Pure Oil Company, at Winnetka, Ill. — Mr. and Mrs. Allen Latham, Jr., II, are the proud parents of a baby son, born on April 19. Allen is completing a year of graduate study at the Institute and at the close of school will take a position with the Polaroid Corporation with headquarters in Boston. — Jack Bennett, II, writes from Los Angeles that he has been out on the Coast for nearly two months, working there with Goodyear. He joins me in extending to all members of the Class best wishes for a most pleasant summer. — PARKER H. STARRATT, *General Secretary*, 75 Fenno Street, Wollaston, Mass.

## 1933

This issue marks the end of our third year as a part of these pages, and yours truly still gets a kick out of hearing from you fellows from all parts of the world. It is gratifying to note the degree of success our fellows have made in this short time.

Here's part of a letter from Nat Goodman — his address is 5267 Pennway Street, Philadelphia, Pa.: "As you probably know, I am still with Sears, at their Philadelphia mail-order plant. Started with them in November, 1934, and after serving a six-month period in the inspection and analysis department, spent the next six months as an analyst in the traffic department. Since the first of the year, the old love of us Course XV boys came to the fore, and have been doing methods work — or time and motion study.

"The adaption of motion study to a plant like Sears is somewhat different from most plants, for almost all our handlings are manual, and deal with paper and merchandise. Hence we generally find it very difficult to create perfect motion cycles, and work only on a modified basis. After the motion study — which never involves the camera — a time study is taken, and an incentive system is established. The plan used is a modification of the Emerson plan, and we don't have any difficulty selling the idea to the employees — no, the difficulty lies in placating them, and counseling patience — that they will get their bonus as quickly as we can make the computations. Of course the work is by far the most interesting that I have done at the plant. There is a good deal of prestige attached to it, since this job is a staff position in the general manager's department. Incidentally, in this work, I am succeeding Russell Brooke, who has been transferred to our Atlanta store.

"Don't harbor any marital thoughts about me, George, for since that Bunny girl ups and gets engaged without asking my permission, I subscribe to the thoughts expressed by our unknown bachelor acquaintance in *The American Magazine* of April. On a trip to Boston, met Ben Smilg, XVI, who is located in the Navy engineering department with Budd. . . . Hear from Jack Farmer occasionally — still with the Fore River group, and still enthusiastic about that institution called marriage or better still — mirage! Saw that placid home-towner pal of mine at Lehigh this past week-end, Ingy Madsen, who is about to emerge on the business world with a master's degree. Gordon Pearson amazed me last January by actually coming down to this town to see it."

Here's part of a letter from Bill Miller up in Scranton, Pa.: "I suppose it's about time I wrote you. When I got home from college after graduation, I found that my wife had presented me with a seven-and-one-half pound boy as a graduation present. (Nearly a class baby.) Now we have a little girl, ten months old. I knocked around town for about eight months, selling vacuum cleaners, and so on. Then I landed a job (political) with the city of Scranton. I am city transit man in the bureau of engineering. As a surveyor I think I make a good chemical engineer. However, if things break right, I hope to land a United States Civil Service job soon. J. Dillard Collins has been up to see me several times. As you know, he is with the Carleton Lamp Company [Palisades, N. J.]. He brought Bill Wessel with him last time he came.

"Last time I heard from Lance Bowen he was with the American Optical Company at Southbridge, Mass. Last summer I received a letter from G. N. Amerman." Thanks for the letters fellows and let's hear from you again.

Preben Oldenburg, petroleum engineer for the Shell Petroleum Corporation, recently at Wink, Texas, has resigned to accept a similar position with the California Company, a subsidiary of Standard

Oil of California. His headquarters will be at Midland, Texas. — The social columns seem to contain more than usual this month. Received notice of the marriage of Bill Pleasants to Miss Anna Louise Greenwood on April 18; Charlie Bell, who is with the Edison Company at West Orange, N. J., was married on May 23; the marriage of Frederick Cone to Miss Rosalie Welch has recently been announced. The following engagements have been announced: Dave Cutler to Miss Patience Widger; Herman Shea to Miss Eileen Curtin; Dick Robinson to Miss Mary Cooper; Gunter Kohlmann to Miss Kathleen Ryan; Carl Carlson to Miss Francis Gueroult. I am sure I express the wish of the Class in extending heartiest congratulations and best wishes.

I knew I wouldn't be able to hold out forever, particularly after announcing all the engagements and weddings I have in these columns for the past three years, so I went ahead and did it. — Yes sir, I got myself engaged. It is with the greatest of pleasure that I announce my own engagement to the loveliest little lady I know, Miss Lucy Francis Rauch of Brooklyn. — GEORGE O. HENNING, JR., *General Secretary*, 163 Barbey Street, Brooklyn, N. Y. ROBERT M. KIMBALL, *Assistant Secretary*, Room 3-107, M.I.T., Cambridge, Mass.

## COURSE I

Course I's notes are due to the combined efforts of Ingy Madsen, Doug Stewart, and Westy Westaway this time. Ingy wrote the first letter to Doug who passed it to Westy, to your editor — million dollar infield or something. Here are parts of Ingy's letter: "Rudy Rosas was in Boston recently; he is married to a beautiful blonde. Rudy is doing construction work in Mexico, and sports a bushy mustache. — Jim Ryder is working on a construction job in Newton, Mass., for Metcalf and Eddy. — Josh Shea is instructor in geodesy, surveying, and so on, at M.I.T. Rudy, who heard him lecture to state engineers, remarks that Shea is a good talker — quite forceful and sure of himself.

"J. B. McAleer is working for the WPA, organizing personnel and preliminary cost and design work for a large project for control of Connecticut River, and so on. The job, if it goes through, will be a ten-year job. Fiddell is more or less in charge, and Barrows is consultant.

"Gene Nedbor works in New York for Rosoff Engineering Corporation. They have large subway contracts. Gene is doing cost work and taking vibragraphs of blasting explosions. . . . Leo Dewar, II, is test car engineer for the Socony-Vacuum Oil Company in New York; also married and also proud possessor of a mustache. He says it makes him look older and more dignified."

Here's parts of Westy's letter: "Doug Stewart has been busy as a bee (in fact, this company keeps everyone doing something) the past two months, doing some special work on turboblowers. He expects to return to the New York office in about a month, where he will do sales

1933 Continued

work in the blower division. These blowers run into big money, around \$100,000. I just recently resigned my job with the Boston Consolidated Gas Company to come down here with Ingersoll Rand. Haven't been here long enough to tell you anything about it; arrived here April 15. I sort of dreaded leaving Boston and the gas works. I certainly had an enjoyable time the past winter in Boston. For three months I was doing full-time work on the Community Fund Campaign drive as staff secretary of the public utility division. The gas company donated my services. However I find Easton, Pa., a very enjoyable place; I don't expect to stay here at this plant over four or five months. Right now we are planning to have an alumni dinner sometime in June for those that are located in this vicinity.

"Ing Madsen, as you probably know, has been at Lehigh University the past two years. He has just finished a thesis on wire ropes. He goes to work this summer with Carnegie Steel." — DOUGLAS N. STEWART, *Secretary*, care of Ingersoll Rand, Phillipsburg, N. J.

## COURSE II

Warren Henderson has very kindly taken upon himself the task of getting a column together on Course II and judging from the following has done an excellent job. Many thanks Warren; do it again sometime.

The first man on the list is George Seavey, now doing research work under Dean Bush '16 at the Institute, after doing traffic survey work on the North Shore. It seems that home obligations and other obligations almost as important serve to keep him in the bachelor state, but he has high hopes for another year. He would like to hear from Alfred Roscher, who was last heard from as working in a textile mill in Gloucester, Mass. — Dick Warner is with Frazar and Company, an old family business, as assistant to the partner or something. He is active in American Society of Mechanical Engineers work. Good for Dick! — Ralph E. Cross is chief engineer of the Cross Gear and Machine Company of Detroit.

I wish that I could acknowledge in a better way, the long letter that I received from Henry Kiley. Henry writes of the many changes in the Metals Processing Laboratories — tut, tut — Building 35 to you. Mr. Clark has retired and Jerry O'Neill '02 is on sick leave; Kiley and Putney are holding forth. Frank S. Coyle is with the C. E. Sheppard Company of New York. He reports that Art Newell '31 is superintendent of the plant. — Ivor N. R. Morgan is with the Aluminum Company of America in New Jersey as an engineer, and doing occasional research work. Aren't we all? We always knew that you couldn't stop this guy Morgan. — Perhaps some of the men remember Louis Phillipe Gingras: He is running the family plumbing and heating business in Quebec City, 34 St. Augustin Street. He attended Carnegie Tech after leaving the Institute.

Hal R. Terwillinger is with the National Aniline and Chemical Company of Buffalo. He says that he has seen Carl Bunker '32 in Buffalo. — Bob McKay is with the Mason Neilan Regulator Company, Boston, supervising installations and engaging in research work also. He has plenty of competition with a number of other Technology men in the same company. — Lieutenant William L. Bell, Jr., is stationed at the Springfield Armory, Springfield, Mass. — Mel Dolan is in Washington in the Patent Office. I suspect that he is a politician, taking into account his Irish heritage and coming from Boston. He is now completing his third year of law at Georgetown University. I approve of all this, heartily. — I have not yet heard from Moe. It seems to me that I taught that fellow how to write during his last year at the Institution. — William Baur is with the General Electric Company River Works, as a time-study engineer. We have a few of that breed in our shop, so I can truthfully say that I knew him when he was a pretty good fellow.

I was very much pleased to hear from one of our little band who fell by the wayside but who had the intestinal fortitude to return to the Lowell Institute and was graduated in 1934. His name is George Fletcher Frazier, and he is now with the Paslode Company designing and selling automatic machinery. — Maurice L. Rubin returned to the Institute and received his master's degree in 1935, and is now an engineering calculator with the Electric Boat Company in Groton, Conn. — Charles W. MacMillan is with the Kent-Moore Organization, Inc., General Motors Research Building, Detroit, Mich. — Richard D. Kimball is in the family business as a draftsman. He has recently married little Maxine Fowler of Melrose, Mass., and is a proud papa. — John K. Campbell is with the Melchoir Armstrong Dessau Company, Inc., of New York, as are also several other Technology men of other years. He was rather vague as to just what his work is, but it is very interesting. He has been a benedict for the past five months. George Lindley is with his father, in the family machine shop in Germantown, Pa. I met George in Cleveland during the recent Machine Tool Exposition. He looked well, although he never showed up at our company's exhibit, where I was one of the attendant engineers. I was very confident that I could sell him a No. Four Universal. — Paul Koether is working for New Departure Manufacturing Company in Bristol, Conn.

Jim Hayes is with Best Foods, Inc., Bayonne, N. J., as assistant maintenance superintendent. Sounds like Jim is a big shot. He contributes the following in his own inimitable manner: "Lieutenant Francis H. MacDuff quite recently married Rhoda Marion Howard, and is living at Mitchel Field, Long Island, N. Y." — Lou Balboni is the works for Balboni's Norwood-Boston Express. — Dick Hodgdon is Minneapolis Honeywell Regulator Company's guiding spirit. — Robert E. Shea is purchasing agent for the

Northeastern Laboratories, Inc. The salesmen will love him. We have one, and a good one, but he cannot afford to be anyone's friend, poor fellow. — Guido M. Garbarino is with the Crowell Publishing Company and is doing swell. We are always glad to hear of the folks who are getting along. It gives the rest of us hope. The last question is already answered. — Jack Meakin informs me that his Class is now '35, and that he is with the Richardson and Boynton Company of Boston. — Well, here's Frank Amadon. Hall Laboratories, Inc., and Hagan Corporation; he works for both. He didn't try to sell me any of the boiler dope, so he must be doing O.K. Box 2, Chappaqua, N. Y., wherever that is. Frank married soon after leaving the old school. We all knew that he would. He has a boy. How's that? — John S. Hunner is with the Income Estates of America. His address is Pasadena, Anne Arundel County, Md. — Frank Vanucci is with the Owens-Illinois Glass Company, Newark, Ohio, as a project engineer in the industrial division, making insulation, air filters, and so on. Frank wrote me a mighty nice letter and invited us all to call on him at any time that we can. Personally, I avoid Newark carefully, as we have an office there, and we never see the place unless there is trouble. — Lieutenant William J. Latimer is still at the Watertown Arsenal, and naturally in the ordnance division. He is assistant to the Commanding Officer. William P. DeCamp, Jr., is with the Mason Manufacturing Company as superintendent. He is married and has two children. — George Hayden is with the Consolidated Lithographing Corporation of Brooklyn and is working in Boston. If I could read his writing I could tell you what kind of a designer he is.

Leonard Bradford finished up in 1935, and is with the Reece Button Hole Machine Company of Boston, as a draftsman and designer. He is married. — Julius A. Ramstedt is in Portland, Ore., with the Ingersoll Rand Company as a sales engineer. He is at 112 Southwest Pine Street. — Had a nice letter from Omar Somers. The writing looked so much like Steve Crick's that I was worried! Crick could never get around to answering so quickly. Omar had an announcement of Bob Timbie's wedding recently. I met Bob's father at the Chicago Fair a couple of years ago, and gleaned a little news at the time. Omar is with the Anchor Cap and Closure Corporation, as a salesman. He informs me that our old pal, F. Alexander Magoun '18, has raised himself a Van Dyke. There is no harm in that. He probably needs the scenic effect in his business. If I needed one, I'd probably have to buy it. Omar is at 47-31 47th Street, Woodside, N. Y., care of the above company.

Perhaps some of the boys remember Howard H. Langdon. He is a professor at the State College of Washington where he is head of the department of mechanical engineering. How do you like that? Besides the work in education, Professor Langdon is in charge of the mechanical



1933 Continued

equipment of a new power plant at the college. Red Williams is with the Ludlow Manufacturing and Sales Company. He does well, it seems, being night superintendent, making jute carpet yarn, whatever that is. Good for you Red, it always fills me with a great deal of pride to see my *protégés* burning up the track. It is not generally known that I perhaps never would have taken a degree at the Institute, if a few kind souls had not taken me in tow at the darkest moment and pulled me over the bunch; names, on request. It was 50-50 with Red and me. The gentleman avers that he is single and intends to remain so. Ha, Ha! Address Red at Allentown, Pa., care of the above company. — Joe Leto is at the home address in East Boston, given in the directory. Williams says he is building motor boats. — Olavi Viita took some graduate work at the Institute and now is with the Bethlehem Shipbuilding Corporation at Fore River, Quincy, Mass., in the welding department — still single, but has prospects. — Bob Keyser is with the American Core-Twine Company, Roxbury, Mass., after two years of rubber in Akron. He is in charge of production and maintenance; was married in May, 1934, and admits that he likes it. — Robert H. White is with the Torrington Company of Torrington, Conn., and is in research. He married Miss Wilma Golding of Melrose, Mass., in November, 1934. I am in ignorance as to what the product of the Torrington Company is.

Clyde A. Dively, who took his master's degree with our Class, is with the White Motor Company of Cleveland. Strange to say, he is living at the University Club of Cleveland, of which I am a member. I cannot recall him, but will look him up at the earliest opportunity. Perhaps watching the tap room door would be the most fun while watching.

Joel B. Stevens, Jr., is with the Tennessee Eastman Corporation and may be reached at Box 364, Kingsport, Tenn., working at maintenance supervision. He reports that they have several Technology men at the plant: R. W. Smith, II, A. T. Regan, VI, and Winfield Parttridge, Jr., X. — Also, it seems that Bob Timbie bobs up again. This time at Elizabethton, Tenn., with the North American Rayon Corporation. He is still married. — Robert T. Gammons is at 1514 17th Street, Northwest, Washington, D. C., and is with a firm of patent attorneys. He expects to take his bar exam next December and to be graduated from George Washington University Law School (evening session), the following June. He asks for the address of Rose, II, textile option. I do not seem to have the address of said Rose, but perhaps Rose will read these lines and communicate with Gammons. — Gunter Kohlmann resides at 40 Rector Street, New York City, and is with the American M.A.N. Corporation. If it weren't for the copious use of the periods, I should think that he is now a maker of men. He advises me of his marriage to Miss Kathleen Ryan at the Upper Montclair Country Club on May 23. Too bad

some of us could not have been there to make things a little more interesting than usual. — Ellery D. Clark, Neil Hopkins, and Walter Galazzi are with the York Ice Machinery Corporation (good customers of ours), the latter two having taken masters' degrees in 1934. Ellery is a machine designer, and says that he and Neil are still single, but Walter is married and has a brand new baby girl.

I have just received a very fine letter from Soviet Russia, from Ivan Z. Rybkin. I knew Rybkin and Kurganoff very well during our last year at Technology, and I find that he was as pleased to hear from me as I am to get his letter and form, filled out beautifully. The rest of you fellows missed something in not knowing these chaps. I had the pleasure of sending their names into the American Society of Mechanical Engineers and I suppose that they still keep up their membership. If anyone is interested, Rybkin is at present connected with Central Corporation, Stankoimport, 2 Khudojestveny Pr., Moscow, U.S.S.R., while Alexis I. Kurganoff is with the Amtorg Trading Corporation, 261 Fifth Avenue, New York City. Rybkin expects to be transferred to London very shortly; I should like to have his address there when he changes. I should be pleased to hear from any and all of our Russian friends at any time.

Well, I have saved a choice bit of information to close this long message. Stephen E. Crick called me on the phone Saturday evening, May 9, about 10 p.m., and we had quite a long talk. Crick has been very busy at many kinds of jobs since he left us in June, 1933, too numerous to mention over the phone. He was driving through with another chap, taking a truck to the East. The mission seemed to be of a secret nature and had to do with the A.A.A. (automobiles, not farming) and he said it was very "hush, hush." I can assure him that it wouldn't be that way very long if he had given me any information because I am, by choice, a professional scandal monger. Hopk will be interested to know that Steve sounded quite a bit more mature than when I last saw him (that will burn him up), and my hopes for him are considerably revived.

A great many fellows think I am taking advantage of them in getting their story and not divulging my own. I have no intention of hiding my light under a bushel; here is the story. I am working for the Warner and Swasey Company, Cleveland, Ohio, makers of a complete line of turret lathes. I have been here since early fall, 1933. I spent almost two years in the shop, becoming in the meantime a half-baked machinist, but also thoroughly acquainted with the product that we manufacture. This knowledge is worth its weight in gold when it comes to applying the customers' problems to our machines. I am at present in the sales engineering department, with the prospect of soon becoming one of a small group of tooling engineers, which prospect is somewhat better in the long run than straight sales work.

I wish to assure every fellow in any way connected with our Class that he should feel welcome to write me in care of the above company for any information that he thinks I can supply, such as addresses and what not. I wish to thank all the fellows who responded to my circular letter, and to urge the remainder to snap out of it and let me hear from them. We can use the information in the fall, because the books close as of tomorrow, May 12. Mrs. Henderson speaks often of the many nice fellows with whom she danced at the Musical Club functions, and hopes that some one will carry her best wishes to Billy Weston of Glee Club fame. I'd like to see old Bill myself. — STEPHEN H. RHODES, *Secretary*, M. M. Rhodes and Sons, Inc., 12 Porter Street, Taunton, Mass.

## 1935

Greetings, salutations, and felicitations for the beginning of another bit of news about the "scrimers" of '35. This time we'll cover the articles from newspapers first. Here are two engagements: Alfred S. Alschuler to Helene Nancy Adler, and Lieutenant Harry W. Englund to Sylvia Simmers. One more of the gang has taken the fatal step: Jack Loomis. The bride is Miss Anita A. Flanders. They will live in Lakeport, N. H. Our last bit of news from the papers indicates that Laurence F. Cleveland, who received his master's with us, has been promoted to the grade of assistant professor of drawing at Northeastern University.

A bit of news about Fred Haigh: After graduation he went with the Imperial Paper and Color Corporation in Glens Falls, N. Y. The corporation is the largest producer of pigments in this country and also makes a washable wall paper. Charlie Ross was there with Fred and the two roomed together. They were both busy with applied research, developing new pigments, improving research, devising ways of cutting costs, and recovering by-products. Charlie was busy on the first two mentioned and Fred on the last two. Fred left there Christmas eve, spent a few weeks at home, and then accepted a position with the J. R. Watkins Company where he is now busily engaged in learning the manufacture of the 250-odd pharmaceuticals which the company produces.

Next we turn to that eminent gentleman and scholar (?) Winnie Winiarski. I last reported that he was with the Flood Country Survey in Elmira, N. Y. Winnie has been transferred to Texas and was at Denison when he last wrote, awaiting orders to begin work on the Red River Dam survey and design. Winnie says that the climate there is his idea of heaven and that the Texas hospitality is even better than it is reputed to be. Denison is a town of about 15,000 inhabitants and very similar to those back East of about the same population. Winnie was disappointed, however, as he did not find the streets full of cowboys.

A bit of news from Bob Dalton reveals that he has been eking out an existence by teaching night school and tutoring pros-

1935 Continued

pective college students during the day. The work has been very irregular and he hopes to find something better in the near future. According to Bob, Guy Haines is trying to connect with Eastern Air Lines or American Airlines, Inc. Cap Perry is with Pitcairn Autogiro. Bob Goodman is still at school assisting in the welding laboratory.

Bud Pflantz worked up so much steam looking for a job that he decided to blow off a bit by writing to me. Here's most of his letter: "I have held my silence all these months because I really have had nothing to write about, or should I say brag about? You see when Commencement day rolled around last year my name was not among those called off from the platform. A few subjects and myself had a disagreement at the last of the term and I found myself out in the cold as far as my degree was concerned. However, I was allowed to go to summer school instead of taking special condition examinations and buckled down to work and passed my courses with marks that were high for me. I completed my work in September and then started looking for a job. Up to now I am still looking. It seems that I am the unwanted electrical engineer. Almost all the other fellows in my course have been fortunate in locating work, but I go on day after day tramping the streets, writing letters, touring electrical firms, visiting agencies, dropping in on former Tech students for 'advice,' and everything else that goes with the hardest job of all — looking for work. I can truthfully say that I can get past any secretary, telephone operator, and personnel manager to see the chief engineer of the concerns. In one case I practically made love to a telephone operator in order to get her to announce me to the chief engineer. (She sure was a good looker.) Another trick I have used is to wave a blank envelope in front of a secretary's nose and state that I have a letter which is to be delivered personally. You'll be surprised how this works. After getting in though, I had to confess that it was all a hoax and the chief engineer, fortunately for me, was able to see a joke in it. He was very nice and referred me to several other firms. I have even offered to work for nothing for a high fidelity broadcast experimental station so as to get experience, but even then I was rejected. However, I do not think that my hard luck will last. At present I am a temporary draftsman for *Radio Today*. I am subject to call when needed, which is about five days a month. My boss is Vin Ulrich. It was through him that I was able to get the so-called job. At least I am getting experience, which is what manufacturers seem to want. The joke about it all is this: I had about five diagrams in the March issue of the magazine *Radio Today*, and, looking for work one day, I stopped back at a concern to renew my acquaintance with the chief engineer, who, incidentally, is a Tech man. He said they could use me if I had some experience in drafting work. Fortunately I had a copy of the magazine with me and showed him my work. He looked at it for a while and then gave me a

look of disbelief and murmured something about the work being too finished a product for a guy that was just starting drafting. No, I didn't get a job, but only the same old saying of 'Well, I'll let you know.' I have seen quite a lot of the fellows in our Class down here in New York. Incidentally, Ridgewood (where I live) is a part of New York City. John Mooring is at present working for the American Telephone and Telegraph Company. He is in the statistical bureau and sure does like the work.

"Occasionally a group of us meet on a Friday night and have dinner and then go to a show. On the last occasion Charles Lucke '34, Don Gittens, Chris Rafferty, and myself met at the Tech Club in New York and from there we started our evening. While having dinner Don chanced to look across the room and thought that he saw a chap who looked familiar. He mentioned it to me and as I looked over who should be staring me in the face but Paul Daley. Unfortunately at the time I could not remember him by any name but Slug, as we members of the Junior Prom used to call him. I was so surprised to see him that I yelled 'Slug' clear across the room. Paul came tearing over and Lucke, who was very much embarrassed at my actions, started to say something about it being a fine way to act in a restaurant — making a fool out of myself — when he spied Paul and himself shouted, 'Well I'll be damned.' Paul joined us and we later went up to his hotel room with 20 cans of beer to talk over old times. Some of the others who join us for these Friday nights once a month are: Paul Germond, Frank Trifari, who also is unemployed, and Milt Brooks. Brooksie, by the way, is doing very nicely at the Brooklyn Navy Yard. I believe that he is making about twice as much as any of the others in the gang. Brooksie and I were in Boston the weekend of March 21. Our object was to see Tech Show and to visit old acquaintances. My main purpose was to see the Placement Bureau and see if they could help me in my search for a job. On this I drew a blank. Brooksie and I had driven up during the night in a storm that was equal to hurricane force. It rained so hard and the wind blew with such great force that it blew a hole in the side curtain of the roadster. Along with us was a lad from Columbia who had never seen New England. To add to our discomfort was the fact that we were unable to travel over 25 miles per hour as Brooksie had just completed a motor job on his car.

"Bob Goodman and Don Gittens were to meet us in Boston and we were to attend Tech Show together. Don had gone up by boat, and Bob works in Tech. The night of the 21st was a night of disappointment for all of us. Brooksie and I had had only two hours' sleep since early Friday morning and when we arrived at the show we learned that some dope had resold our tickets. We had sent Bob Goodman the money for the tickets, which he had purchased and left with the management for us to be called for at the door, as we were all going in different

cars. Our tickets in Row B center had calmly been sold by the management to, no doubt, some of their friends. There we were, no sleep, practically worn out, calling for our tickets. We were about 15 minutes late as it was and had to argue with about four guys who kept passing the buck. I could have understood it if we had merely reserved the tickets, but when we had paid for them and had invited girls along, it made me mad. We finally were forced to sit three rows from the rear. As yet I do not know whether or not Bob Goodman was able to get a refund. Incidentally we missed almost all of the first act because of it. We also had to send someone in to get Bob Goodman to prove that he had paid for us."

Our next bit of news is from Dud Dudley, who is still with R.C.A. in Camden, N. J. He has been making a tour of the various departments and has been working on testing, rating, and design of cathode-ray tubes. Recently he has been in the factory and has discovered that there is quite a bit more to the manufacture of glass and metal tubes than he had formerly suspected. While in the cathode-ray tube department he met C.E. Burnett, VI-A, '32. Dud is continuing his graduate courses in economics and electrical engineering at Columbia and says that it takes up so much of his time that he has none left to get into mischief. He reports the following: Louis Fong has been in New York for some time, being employed by the Pilot Radio Corporation in Brooklyn. Bob Carr is working for Arcturus Radio Tube Company in Newark. Herkart is still with R.C.A. in Harrison. Hank Ogorzaly has decided to remain another year at Tech in charge of one of the chemical equipment stations.

A letter from Jack Hossfeld reveals that Art Hamilton is working for General Electric, at Lynn, Mass., has become engaged, and expects to be married in the fall. The bride-to-be is Evelyn Smith. Art likes his job and he must be liked for he has received two raises so far. Jack also enclosed two letters. Here is the first one, from Don Gutleben: "I still like the job a lot and have been having a fine time in this old Zone. The weather is always hot during the day, but it cools off at night. While roasting here I've been reading of the snow, cold, and storms in the States. One morning I woke up almost frozen, the thermometer read 70 degrees! I must be getting soft. Right now in March it hasn't rained a drop in two months and won't for at least one more. The hills are all brown and burned; nearly every day there's a brush fire nearby, but for some reason they never cause any damage to the towns. I don't believe the Pedro Miguel firemen have been interrupted from their pinochle more than once in the last 20 years and that's when they were moved to new quarters. The houses are nearly all wooden buildings with long, overhanging eaves and plenty of screening even though there are now no flies or mosquitoes. I live in one of the bachelor quarters which is just a big barn cut up into 24 stalls on two floors. Each room contains a large, dry closet, kept that way



1935 Continued

by means of a 100-watt lamp. All clothes have to be kept in these closets. I'm becoming used to the quarters now and don't see nearly so many spiders and cockroaches as formerly. Anyway it's nice and cool for sleeping at night. I get most of my meals at a government clubhouse just up the hill. There is plenty of griping like there used to be at good old Walker, but that's natural. The clubhouse also contains bowling alleys, a library, barber shop, soda fountain, and nightly movies. The government operates commissariats which sell about everything. The only transportation between Pedro Miguel, Panama City, and Balboa (7 miles) is by *chiva*, or native bus, driven by crazy drivers, on no schedule, the old rattletaps ready to fall apart anytime. Thus I was forced to part with 50 bucks for a '28 Whippet coupé. After a little fixing up it has served me faithfully for nearly half a year.

"As usual there's been lots of parties and social life here lately. A bunch of us from Tech have been going on boat rides, picnics, and swimming parties over the week-ends. On Thanksgiving I had a dip in the Atlantic and on Christmas I tried the Pacific. My hours of work are usually from eight until four, sometimes from seven to three. This gives me plenty of time to play golf after work and I've been going out several times a week. I'm still at the Locks at Pedro Miguel and my time is divided between shop, field, and office work. Lately I've been detailing steel and making drawings of a highway extension across one of the gates. The job was finished last week and Army trucks have been pouring across it lately for dry season maneuvers. I've also been studying the various equipment, doing some surveying, electric welding, and other odd jobs that are always coming up. I fill in on the towing engines once in a while when there are lots of boats passing through. The Locks organization is divided between the Pacific Locks (Pedro Miguel and Miraflores) and the Atlantic Locks (Gatun) with the general superintendent here at Pedro Miguel. The operators are all skilled machinists or electricians and many of them were here during the construction days. Since everyone has an annual vacation of two months, with pay, these men have traveled all over the world, and it would be hard to find a better group of men to work with. My year will be up in July but I haven't decided what to do yet. I believe I can stay on here about as long as I like. Anyway I'll take my two months' vacation and look around in the States this summer." When you get here, Don, you might drop me a line and I'll be able to tell you where to find those fellows you may care to look up.

The other letter Jack sent along was from John Bradner from Cleveland: "I've been planning a letter, m'lud, but these past few months have been busy ones. What with my marriage, the honeymoon, and then getting settled in our new home, I've been tearing around like a chicken with its head off. But let me begin at the beginning. I was married to Leah Colman

on January 2. You probably recall some of my babblings last year about the 'Duchess.' The honeymoon we spent in Florida, partly at the Riomar Club at Vero Beach and partly at the Vinoy Park in St. Petersburg. Getting back here to one of the worst winters in history wasn't so good. We've finally gotten our house settled and are comfortably ensconced in a lot of new furniture which we are taking all sorts of trouble to keep spotless. I've got a whale of a good job with Lees-Bradner. At the present time I'm in the engineering department. Shortly I will go down to the factory. I'll be there for several months and then I'll be shifted to the sales department, where I will be permanently. It's a bright outlook, for the machine-tool business seems to have a good future."

A note from Al deRoode tells us that he was surprised at the snow and ice in California during the winter. Al is engineer at the Lava Cap Mine in the Grass Valley — Nevada City district. The mine is the third largest in the district, an old quartz mine recently rejuvenated, and is the largest producer of silver in California. News from another miner let us in on the information that Stan Lane is still with the American Smelting and Refining Company plant in East Helena, Mont. He is at present a chemist, but expects to try his hand at assaying soon. He hopes to get out into one of the company's plants in the near future. He says that it is a swell place to live . . . even though the night life is not so slow as one might expect. Stan tries to make one believe that he really enjoys the earthquakes, and, incidentally, they still have a tremor now and then. He enjoyed some swell skating and skiing during the winter and has been playing golf since the passing of the snow. The golf course is constructed of oiled sand and is a rather picturesque affair. Stan rooms with Carl Stratton 34, another of the boys in the lab. According to Stan, Tom Graham is still doing great things for the Anaconda Mining Company in Great Falls.

Lew Simon, it seems, is having a swell time in the design department of General Motors Corporation in Detroit. His only cause for complaint is that he is too far away from the East and does not get a chance to see the numerous members of the Class who are located in that part of the country. He is trying to get a couple of weeks off in order to come to Alumni Day. Let's hope he succeeds. Here is Lew's description of car designing there: "The designers first make 'bee-oofiful' sketches — way out of scale. Then if they seem to have promise, a full-sized working drawing is made, and the thing is modeled up in clay. Then they get around to modeling up a car — full size — out of clay. Of course we use a wooden framework and real wheels and tires. The drawings for the shop are made on blackboards about 20 to 25 feet long and seven feet high. That is the work which I am doing now, and if you think it is a snap to make a mechanical drawing of a car full size and still keep it accurate to a 16th inch, try it sometime; especially

when the lines we draw are about three 64th inch wide. Well, when about 300 sketches for a car have been examined, and dozens of full-sized models built, and everyone — at least everyone who counts — thinks that it might be all right, a full-sized model is built of wood; all hardware, of metal; controls installed; and the job is upholstered and painted. By looking at these models it is impossible to tell them from real cars; you can climb all around them. When they roll in what appears to be the 1937 Cadillac with the ignition key even hanging in the lock, it sure looks tempting. Incidentally all but the finishing touches have been done on the '37 cars. We started on the 1938 Chevy almost a week ago." (Secretary's note: the letter was dated May 1.) There are two other Tech grads in the art and color section with Lew: Bud Greene '31 and Wen Holt '29, both architects. Wen also is an old time *Voo Doo* man, so the magazine is well represented. Lew says to "hold your hats when the '38 models come out." He also gives us the welcome flash that Bud Pflantz just landed a job as safety engineer with an insurance company — no more details available.

Here is a letter from Ed Taubman: "My activities to date are far from being startling, but here they are for what they're worth. Having been subject with the rest of you all for the past seven years to the story that jobs were nonavailable, I went questing immediately after graduation without the usual two months' vacation. I tried the department stores in New York first where a number of Tech men are holding responsible positions, but since summer — their dull season — had arrived, the prospects weren't so cheery. By a stroke of luck and a good introduction from Course XV's Secretary, I bumped into the purchasing agent of B. Altman and Company, who was laboring under the impression that any Tech grad is a young genius. I worked five months there until he finally became deluded. . . . Seriously though, he expected me to work revolutionary changes without *carte blanche*. Every time I started to investigate something or other it began to impinge on some bigwig's toes, or if it wasn't that, it was beneath the dignity of B. Altman and Company. Finally matters came to such an *impasse* that I spent 30 of my 40 allotted hours per week striving frantically to discover something to do and the remaining 10 in being sort of an office boy. Of course as soon as someone died or left I would be promoted, but since the sovereign state of New York still electrocutes trigger pullers, I decided to try some other field before I suffered the ignominy of a flat discharge, which I felt I deserved, judging by the amount of work I was doing. It was a damn shame as I sure had a swell boss who seemed to like me quite a bit. About this time, however, my Dad found he could use me very advantageously in his own business, a chain of accessory stores. So I shot down to Newport News last November. It was quite satisfying to stop being a small cog in the big wheel and be the whole works.

Whether or not I'm well enough equipped to be that is still a moot question my Dad and I argue rather forcibly about. One thing, I never have to worry about what to do any more — the day isn't nearly long enough to do all the necessary things.

"Moreover, there's the question of bills and taxes. They're so new to me that I still get a kick out of trying to figure ways and means of meeting them. Taxes have become my sore point. Seriously I would like to take up the space of *The Review* with some discussion of this subject, about which all I probably know is that they have to be paid, come hell or high water. (Secretary's note: the discussion which follows is not sponsored by *The Review* or your Class Secretary, but is presented as being an interesting viewpoint on the matter.) I've noticed, in some of the letters in *The Review*, complaints about the general low level of salaries. I expect that many of you still lay this to the prolonged depression. To a certain extent this may be true, but to a far greater degree it can be laid at taxation's door. I'm not referring to the present administration, but the fact that for the past decade or two taxation has been so steadily increasing far out of proportion to the benefits derived from it. I could fill the rest of this page which I have just started with a list of the taxes my Dad's business has to pay, and from what I hear, we are one of the least heavily taxed of all businesses. Of course, if everything could be passed on to the final consumer, everything would be fine and dandy. Today's intense competition, however, forbids such a move and the only alternative is to take it internally. This is fine for inaugurating more economical and efficient ways of running a business, but only to a certain point, because after that the quality of the product will have to suffer. At any rate when you consider how you work like hell to make a living and then, after giving the greater amount of your net profit to the various governments, see a lot of half-baked, senseless politicians squander, waste, and generally pilfer these taxes, it makes you boiling mad — which must be the way I sound at present. (Secretary's note: right you are about sounding that way, Ed.) I've heard it said that everyone kicks about taxes but nothing is done about it. Well, why don't we? We are not many to be sure, and probably the extent of our understanding of the subject beyond their actual exorbitance is almost nil; still if some one, meaning us, doesn't start the ball rolling, conditions are due to get a lot worse. For a far better explanation of what I'm trying to argue about, I'd advise reading Frank R. Kent's syndicated articles on Washington which appear in many morning newspapers. Really, fellows, I'm not an agitator or a Red, but I've been placed in the position rather young where the matters whereof I've prated are glaringly apparent even to one whose experience is as limited as mine. I wonder what your reactions are?"

My personal guess on the matter, Ed, is that it will require a more powerful organization than ours to do much about the conditions. Furthermore, every one of us is too busy making a place for himself in this world of business to be taking chances on reform movements. As a suggestion, why not make a study of the taxation problem for a number of years and then present it to the gang after we have become better established and have developed sounder judgments. Ed also reported some news about other members of the gang of "scrimers." Al Johnson is working for E. L. Patch Company in New York as a detail salesman and is having a swell time. Carl Smith has left the pioneer country of Maine and is working in New York for a chemical concern. Johnny Teasdale left with Carl and is in New York also. Ed is in Annapolis now and requests that if any of you fellows are expecting to inspect your Baltimore plants that you get in touch with him. Ed says that if he were not saving up for a car during the winter, he would have sent a set of red flannels to Johnny Duff in Buffalo.

Roger Needham finished up his work at school, having been a transfer as you may remember, took a short vacation, and then went to work for the State Mutual Life Insurance of Worcester, where he is working in the actuarial department. — Sid Grazi has had an interesting time since graduation. First he accepted a contract to lead an orchestra at a summer resort in New Hampshire. He had a fine vacation there and a good bit of relaxation from the grind. When the summer ended and with it the job, he faced the cruel world and started looking for permanent work. He first got a job surveying in New York City and thought that he would turn to ice before the winter ended. In February opportunity knocked, and Sid was not slow to open the door. Result: He is now in Washington working for the United States Department of the Interior on their educational program, especially that having to do with radio programs. He is officially assistant production manager and he helps direct and produce musical and dramatic radio programs, which are turned out by the script department for recording. The programs go out over NBC and CBS and Sid is responsible for the sound effects required by the script. He also is responsible for the music whether such is the theme, background, or incidental to the program. Sid says that the work is very interesting and that he is learning many valuable things. If the work is a success he expects to be able to remain on the job.

While in the process of writing this set of class notes a letter has come in from Mal Porter. Mal has changed jobs since last heard from. He is now working for the Cripple Creek Milling Company in Cripple Creek, Colo. He is testing some of their ores by a flotation process and likes the work very much. Mal had a rather interesting story to tell about a Tech graduate of a few years ago: "Bill Perry 22 was walking down one of the

main streets in Helena when earthquake Number 461, the big one of October 31, came along. There was no possibility of mistaking one, and as this seemed to be prolonged and not to be confused with the usual daily hundred or so little ones, Bill took to the center of the street, as every good citizen of Helena has been cautioned. Suddenly a stranger came running up to him, quivering all over, and asked, 'Say, do you folks here in Helena consider this a bad one?' Bill never forgets his poise and answered: 'Why no, you ought to be here when we get a big one.' Taking time out to say, 'Well I'm getting out of here,' the fellow disappeared down the street in a cloud of dust. All the while Bill had been making his classic understatement, buildings all around Helena were being leveled to the ground. Bill also had an invention for the earthquakes. After Number 71, the first big one, he tied three strings to the head of his bed: one tied to the light, another to a quart of whiskey, and the third to the door. In case of another earthquake the strings were to be used in just that order. Since most of the big ones came at night, quite a popular saying around town was: 'I've got one under my bed too.' It seems to me that Mal and Bill could have added one more string to the group. The fourth could have been attached to a trap door which would automatically drop one into a chute which would deliver one safely to the street.

Art Haskins has been one of the most faithful in supplying news about classmates, but has had little to say about himself until his last letter. The whole thing revolves about the fact that he has moved into the house next door to the one he used to be in. Naturally one would wonder why the sudden change. It seems that the reason was that Art up and got married. Helen Doris Proulx is the joy of Art's life and they have taken the house next to where Art used to get room and board. They were married April 18 and now reside in peace and comfort. Art is perfectly happy for he can run next door for meals if the little lady tries any tricks on him. Congratulations, Art. Art reports that Ted Earl has left Bath, Maine, for points south. He is going to enter the Naval Reserve Flying Corps and has reported at Squantum. Johnny Westfall also has deserted the iron works. He was last known to be in the hospital in North Conway, N. H., as a result of having taken his skiing too seriously. The troubles occurred in Tuckerman's Ravine on Mount Washington. Art also sent along a bit of news about Al Rogowski, and although he is of the '34 breed, I'll repeat it here, inasmuch as he was well known to many of our Class. Al is now working as a testing engineer for the Worthington Pump and Machinery Company in Harrison, N. J. He likes his work and has to keep up on his studies in order to swing the job.

Here is the story Mel Farquhar has to tell: "... To begin with, I landed a job last July with the McKay Company in York, Pa. The business was chains, and tire



1935 Continued

chains was the main product. Well it was a hot, dirty, screwy, cutthroat business, and the longer I stayed there the less I liked it, so I decided to get out of it. Was in Boston at Christmas time, and saw Professors Holt and Riley. Got leads on jobs in the power-plant line from them, and went to work on the leads about the first of the year. Rang up a 'no sale' on all three of their leads, so decided to look around on my own; got an American Society of Mechanical Engineers catalogue and looked up boilers in New England; picked Riley Stoker Corporation as a victim, and wrote to them on January 27. On January 31 two things happened: The tire chain business was getting slack, and as I was the youngster in the business and they decided to cut expenses for the summer, I got laid off; also on that date Riley Stokers wrote and wanted to know when I wanted to work for them. So on February 10 I started work for Riley Stokers in Worcester; went to work on the board, drafting boilers. About two weeks ago they started on a job in East Walpole, and three times within a week I was up there with a party measuring up the boilers of F. W. Bird and Son. Five o'clock on a Monday afternoon I was told to start for there at 7:30 the next morning. Then on Friday I was told to get there by 8:00 Sunday morning, and then on the next Monday I was told to go up again Tuesday afternoon. That is the notice they give you. Today the general manager of the engineering department, the chief operating engineer, and the chief erection engineer had a powwow, and then yanked me in and told me to go up to Lynn this week-end and be prepared to stay on a job there for the Lynn Gas and Electric Company until it is finished. The material will start to arrive Monday, and I'll be the only one there from Riley Stokers to receive and check it for the first couple of weeks. They are putting in a whole new boiler. Then I will stick around while it is being set up, and remain with the operating crew, who run it for a month or so until it is running properly. I'll probably be there until the middle of August anyway. From then on, I don't know where I'll be; may be back here in Worcester in the office again, or out on another job. They have jobs in Michigan, California, the Virgin Islands, Italy, China, Texas, Pennsylvania, Massachusetts, West Virginia, Maryland, and others, but wherever I go, I'll be greatly surprised if it is out of this country. Got to Fort Hancock last summer for two weeks with Hossfeld, Charlie Bowen, and Gardner Fox, and a wetter two weeks I never spent. It rained two thirds of the time."

Al Mowatt crashed through this time. He sent me a letter, and in addition I have one from him which was forwarded to me from Art Haskins. Here it is, lads: "I had better start at the beginning and tell all: We sailed from New York on January 10 and landed at Turks Island on the 15th where we dismantled some machinery and loaded it into a small boat of ours. The boat is a sail-powered

craft, 34 feet long, and, with all the stuff on board, was carrying ten tons! We had a hectic time coming across the 160 miles to Inagua in a gale and very rough sea. Time after time waves broke right over the boat and we wondered if we would ever make it. We got here on the 19th and started out to set up the plant. For a month we were very careful about taking off shirts, and so on, but now we go around all day with only a pair of shorts and shoes. Most of the work up until last week was foundation work that had to be done before we could start production. Last week we started bringing in our first salt and up to this date (April 5) about 16,000 bushels have been brought in. The production is way ahead of our poor truck, so it is up to me to figure a better way to do it! By the way, when we tried to land the truck from the boat, the derrick broke and we spent four days in salvaging it from the briny deep! You can imagine the condition it was in — a new one at that. On March 1, I was placed in the position of — now hold your breath — general manager! I am now second in command. . . . We have about 40 men working now and the foremen's hands are full. In the daytime I am working with Jim Erickson here at the desk, figuring out work schedules, drawing plans, and so on; or we are out taking charge of the more important jobs, like placing the derrick. In the evenings there are innumerable letters to write for the two companies. The other is the West India General Store of which I have complete charge and two clerks are busy there most of the time. The chances for the future are very bright, especially as this thing is just getting under way and looks as though its structure in the near future would be colossal. I am surely lucky to be in on the ground floor. It is up to me now to work hard and do a good job. Besides that I have the offer of a partnership in a subsidiary of this company. The possibilities are unlimited it seems. (Secretary's note: The name of the company for which Al is working is The West India Chemical Company, Ltd.) I had better tell you something about this place so you can picture it better. The island is about 50 miles long and 20 miles wide at its widest, and only five miles across here. We are at present living here in the town but are building a place at the ponds one-and-a-half miles out. The population is about 800 with about four real whites besides ourselves. There are a lot of half-breeds of unknown origin. In the town there are a lot of little shops, four churches, a hospital, library, post office, police station, and jail, besides a radio station to the outside for cable communications. The land is very flat. It rises about 10 feet abruptly from the water and does not vary more than 20 feet over the rest of the island except for two hills which reach the terrific height of 90 feet. There are few big trees, most of them being about 15 feet high with lots of thorny brush. Today we are taking our first Sunday off from work and are going shark fishing. . . .

"The President came along to fish off here last week. He was here on board, was accompanied by three destroyers, and anchored here for two days. A week before, a tramp steamer stopped and put its 50 people ashore for three hours. They hired our trucks to see the island and we drove them out to the pans in loads of ten. It was great fun to talk to some nice-looking American girls once more. The latest thrill was an airplane ride with two men down here from the Harvard Museum. It was my first trip and I certainly got a thrill out of it. Time goes so fast down here (Inagua, Bahamas) and the temperature is so much like our summer that it doesn't seem possible that spring was up there and the crews were on the river. Down here the temperature is hitting the high spots, with summer still on the way. We are having heat of 110 degrees to 130 degrees at noon daily and it drops to 80 degrees at night. The strong trades are the only thing that keep us from burning to a crisp. You can well imagine the tans we have — and our hair is bleaching out to corn color. It is quite a lot of fun to be able to go swimming in the ocean any time. Even now it feels like a New Hampshire lake on a warm day in summer."

From a news bulletin of Chi Epsilon we get the following information: George Bull, Jr., is a splicer's helper for New York Telephone and Telegraph Company and is "God knows where." George wishes that he had landed a job with the Florida Telephone and Telegraph Company. Bernie Nelson is in the same class with George. Bernie also thinks that the winter is no time to be hanging onto poles. Lorin Presby went to work last July for Phoenix Engineering Corporation in New York City. He has been making hydraulic studies for a proposed power plant in Arkansas and is going to school two nights a week. Winnie Winiarski is, as I think I mentioned before, working on the Red River survey in Texas. Carl Lavenas is working for the E. I. du Pont de Nemours and Company, Inc., on the construction of a large rayon plant in Argentina.

Dick Lawrence dug up the following news during the month: Dick ran into Ken Young and his wife. Ken was married last summer and is with Hygrade Sylvania Corporation. Joe Doucette, who announced his engagement to a Newton girl last Christmas, will be married sometime in the near future. Leo Beckwith is with Market Forge Company, a concern which sells stainless steels of all kinds. John Duff has moved to Albany. Bart Chapman is looking quite prosperous and is still making ammunition down in Bridgeport. Dick received a letter from Dick Purcell who has been working these many months in the British West Indies: "At present I am grand pappy to a lot of 'puff puffs,' i.e., superintendent of the Bowden and Golden Grove Railroads. They consist of about 30 miles of narrow-gauge track in the eastern end of the island and belong to the United Fruit Company. We draw cane and sugar

1935 Continued

to and from the factory and bananas from all the plantations to the wharf. Life is pretty easy. The company furnishes me with a large furnished house of seven rooms, two-car garage, and so on; but its pretty much in the jungle — so I guess I am following Tubby's senior banquet advice and leading a life of sobriety and celibacy — well, celibacy anyway, as I have before me a jug of cocoanut water and a quart of Red Neck Rum. That's the local brand, pretty good stuff, ten years old and four shillings (a dollar to you) a bottle. I spend most of my week-ends hunting alligators in the swamps. You might be interested to know how we go about it: Being blue-blooded sportsmen we like to sniff out our game, but if that brings no results, we go to the nearest village and purchase a meager dog for 50 cents, take it down on a short beach about 20 feet from the water's edge, and take cover. The dog about dies of fright while the saurian is sneaking up on him, but he is safe, for even if we miss, the noise sends the 'croc' back to the water. (I use an Enfield .303.) I have bagged six to date, and I am having the hides cured. The largest was nine feet, two inches, but they grow to 12 feet.

"I am keeping house for myself and it is as big a problem as the railroad. I have two servants and they seem to know more about it than I do. They get one dollar a week, each. I can live on five dollars a week, including servants' wages. We pay, however, 37 cents per gallon for pretty lousy gasoline. All the high-compression Fords, Terraplanes, and so on, knock like the devil. . . . I sure miss the old hang outs such as Montanas, the Monarch, the Statler, and the lower joints. The names of my two alligator hunters or gun bearers are Perdue Paterson, and Don Pedro Jose Jesus Gonzales; some names, but they are good eggs just the same. This is a

great place for a honeymoon, so if any of you boys are feeling that way come down — I have lots of room."

Dick Lawrence also reports that Art King is with the treasury department of the Mengal Company trying to dope out ways and means of avoiding income taxes without attracting the attention of the G-men. Dick also mentions that Andy Anderson is in the accounting department of the Gillette Safety Razor Company in Boston. After looking in my files I find that there are only six Anderson's in the Class, any one of which could be referred to above. However, after due consideration, I have reached the estimate that Lars Anderson is the boy referred to.

There remains only the job of giving an account of my own doings: Like many of the other boys I have been jumping about the country. In the last article I reported being a research assistant on the Quoddy Project. At present I am working in the employment department of TVA in Knoxville, Tenn. I bettered myself financially by the move and expect to learn plenty about the ins and outs of personnel work in large organizations. So far I have not had time enough to get about and see some of the projects here, but expect to in the near future. I am living in the Y.M.C.A., which is only three blocks from the Old Post Office building in which the offices are located. The town is an interesting one, but above all sooty, and I can say that after having been born and raised near Chicago. The suburbs are beautiful in certain sections, and so is the surrounding country, but the center of the town itself is a mess. There really is not a good store in the town for general buying of clothes, and so on. I expect to be able to get to Chicago once in a while and will probably stock up there on the "niceties of life." So far as I know I'll be here for quite sometime to come, so letters in the future should be addressed as indicated below. —

THE TECHNOLOGY REVIEW

ROBERT J. GRANBERG, *General Secretary*, Y.M.C.A., Knoxville, Tenn. RICHARD LAWRENCE, *Assistant Secretary*, 111 Waban Hill Road North, Chestnut Hill, Mass.

1936

Course Secretaries to keep in touch with the members of the Class in their courses and to forward news about their Associates to the General Secretary have been elected as follows: I and XI, Anton E. Hittl, 23 Sewall Street, Melrose, Mass.; II, James F. Patterson, Sea Cliff, N. Y.; III, Charles F. B. Price, Jr., Quantico, Va.; IV, David A. Werblin, 1721 Avenue O, Brooklyn, N. Y.; V, Robert M. Sherman, Jr., 114 Summer Street, Fitchburg, Mass.; VI, Nicholas Lefthes, 11 Ward Street, Salem, Mass.; VI-A, Martin A. Gilman, 58 Sisson Avenue, Hartford, Conn.; VI-C, Jackson H. Cook, 16 Belfry Terrace, Lexington, Mass.; VII, Edward L. Pratt, Knob Hill, Great Barrington, Mass.; VIII, Charles H. Evans, 24 Arlington Street, Haverhill, Mass.; IX, Everett H. Cargen, Jr., 59 Fairmont Street, Belmont, Mass.; X, Elwood H. Koontz, 157 Bonair Avenue, New Rochelle, N. Y.; XIII, Arthur E. Wells, Jr., 212 William Street, East Orange, N. J.; XIV, John P. Hamilton, 35 Dixon Street, Bridgeport, Conn.; XV, William W. Garth, Sebasco Estates, Maine; XVI, Julius B. Schliemann, 2 Davis Place, East Orange, N. J.; XVII, Richard E. Hickman, 39 Prospect Street, Brockton, Mass.; XVIII, Eli Abraham Grossman, 26 California Road, Mount Vernon, N. Y.

It is the duty of the above men to see that we have a well-rounded contribution for these pages. I should like to hear immediately from each of them and would appreciate letters from other members of the Class, in order that we may start October with some interesting notes. — ANTON E. HITTL, *General Secretary*, 23 Sewall Street, Melrose, Mass.



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